THE FARMERS' REGISTER.

VOL. VII. OCTOBER 31, 1839. No. 10.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON KEEPING SWEET POTATOES. SQUASHES AS FOOD FOR HOGS.

To the Editor of the Farmers' Register.

South Carolina, August 25th, 1839.

I have thought, for some time past, of giving you an answer to some inquiries on the subject of preserving sweet potatoes, in your last November number, my mode of keeping them, and the only practice I have found uniformly successful. I have tried many of the plans that have been recommended for some years past. That recommended by your Georgia correspondent, P. C. H. I have been more successful in than any other; but have been frequently subjected to disappointments and losses, which resolved me, almost, to leave off raising any more than my family could use by digging time. And, I will here remark that, in my opinion, the practice of leaving a hole in the top of the bulk has been the cause of the distruction and loss of more potatoes, than all other practices together.

Having, in the fall of 1832, commenced putting up my crop as usual, one of neighbors who happened to be at my house, and to whom I was complaining of my bad success in keeping potatoes, requested me to let him superintend the putting up my crop; stating at the same time, on my expressing some doubts as to his practice, that if my potatoes rotted, he would furnish me seed gratis the next spring. I agreed to his proposal, and attended him to my garden to witness his *modus operandi*.

He first levelled a bed of suitable size, for the quantity of potatoes intended for the bulk; but did not raise it, as recommended by P. C. H., as taking the earth to the depth of eight or ten inches from around the bulk, to cover it with, would leave the potatoes sufficiently elevated. After levelling, he laid on some dry straw, (not much,) and on that the potatoes. When the heap was finished, of the usual form, straw was laid over, of sufficient thickness to keep the dirt from mixing with the potatoes; then earthed entirely over, and made compact, to the depth of a foot; the soil being of a loose and open nature. The object being to *exclude the air entirely; the "sine qua non."*

"It is important" said my friend, "to have a good shelter over the bulk, for, wherever water penetrates to the potatoes, there you will find, on opening the bulk, some rotten ones; but otherwise all will be found perfectly sound. There should, also, be a drain leading from the excavation around the bulk, (which should be smoothed out at bottom,) to draw off the water that might, by standing too long, be taken up, and injure the potatoes."

Thus, I have given you sir, in my loose way, my friend's mode, which I have practised for six years, with entire success. I put up both my eating and seed potatoes in this way; my bulks standing at the base about four feet apart, and on a line, so that my shelter may be continued the whole length of the line of bulks; breaking when wanted for use, one at a time, and removing it to my potato house. Which, if I thought it was necessary, I would willingly give a description of; but, as almost every farmer knows how the cellars in common use are made, I think it unnecessary; except to say, (and that is very important,) that the upper part of mine is left open throughout its whole length, and over which, to keep out rain, a short set of rafters are straddled, lathed, and a course of three feet boards nailed on each side. I am of the opinion, that it would be an advantage to extend the roof down to the edge of the ditch that surrounds the house, in which case the covering of earth would not be necessary to be so thick as is common.

My puncheons were split in the spring previous to building my house, and laid up to dry; and for several days previous to putting in my first potatoes, which consisted of all those that were cut or broken in digging and removing to the bulks, I had a small fire kept up in the house; and my practice has been to keep up a little smoke in it for a few days after removing each bulk to it, and also, during every cold spell through the winter. Keeping only the slat shelter closed in mild weather, and in cold weather, closing both; but, at no time do I close up the opening at the top of the house, which is intended for the escape of moisture and smoke. Thus, differiing with almost every one else, in *closing* my bulks which are commonly left open, and in *leaving the top of my cellar open*, which is usually closed by others. I would here remark, that the *opening* spoken of, is nothing more than the cracks at the ends of the puncheons, at least three inches of which should be left naked.

I have found my cellar very convenient for keeping roots of every description in, for winter and spring use; such as beets, carrots, parsnips, &c., and one winter I kept a crop of cauliflowers in it, (the heads of which continued to grow for some time after removing them from my garden; the roots having been laid together, and lightly covered with moist earth in packing them away).

Potatoes should, *invariably*, be dug before a heavy frost; for, I have found that whenever the vines were thoroughly killed, those potatoes nearest the top of the hill were injured. They should also, be carefully handled, as they are frequently bruised, and much injured, by throwing them to the piles, and into baskets; and, also, in emptying them into the baskets. Most persons recommend them to be well dried, before putting them up; I would prefer airing them, myself, weather permitting; but have put them up on the same day they were dug, and found them as sound on opening my bulks, as those that had been dried.

In looking over some volumes of the American Farmer, a valuable work which I commenced taking in 1829, and which very much alarmed some of my friends, least I should be ruined by "book-farming," I find some information on the subject of the preservation of sweet potatoes, that you may think worth transferring to the Farmers' Register, for the benefit of your readers, particularly in the 12th vol. p. 139 and in the 14th vol pp. 75, 193 and 258.

I have always been afraid to venture on keeping a large quantity of potatoes in a cellar, as seems to have been the practice of the writers of the communications above referred to; but do believe the *smoke* (as recommended by them) to be absolutely necessary in preserving, even a small quantity, any length of time; and the authority is very good, that it will have the desired effect with any quantity.

I will only add in conclusion of the subject, friend Ruffin, (and I consider you the best friend of every farmer,) that if any one of your readers should not have faith in the plan I have above attempted to recommend, let him try it on a small scale. And I am certain his faith will be strengthened "by works."

As I have some room left, I will communicate a fact to my brother farmers, the knowledge of which (if acted on,) will, in my opinion, prove highly advantageous to them, particularly those in the southern states that have no clover pasture for their hogs to run on, at a season of the year when food for them is generally scarce; and where stubble land should be at rest, instead of having every thing eaten off of it, and trod to death in the bargain. But, to the fact; it is, *that I am at this time feeding to my hogs* (a small stock,) *two bushels of squashes daily.* This from a half acre of poor land, manured in the hill with the scrapings about my pens, principally corn-cobs. Having last spring, resolved on the experiment, I laid off an acre of land for the purpose; but, could not procure seed to plant so much. The half, therefore, that was intended for the latter planting, I had planted in pumpkins; and although the season had been unfavorable to both, the yield has been astonishing; and has convinced me, that vines will amply pay a man for the additional trouble of cultivating them to themselves; not taking into account the injury corn sustains by crowding them on the same ground with it.

In gathering my squashes (of which I have a great variety) I have my patch gone regularly over, so as to use them before they become too hard; but if some should become so, they are not lost; for my hogs appear to be equally as fond of them as the soft ones.

As soon as they are penned, I intend to commence feeding my fattening hogs on the pumpkins; first boiling and mixing a small proportion of corn and cob-meal with them: and to continue that food as long as they last. Then with dough made from the meal, and to finish on.

I have never known any person besides myself, to raise the squash with the view only of feeding hogs, though it has in all probability been done. I am very sanguine in the belief however, that if the value of the article as food for hogs, was *generally* known, the practice of raising them for that purpose would be, in the south, universally pursued.

To conclude, if by writing this communication, I can succeed in introducing such practices as are recommended, I shall be happy in believing that I have not lived altogether for myself. S. . . . . .

BREEDING AND REARING SWINE.

From the Franklin Farmer.

For economy, I would advise the farming community to select out of their herd of swine, every spring, as many female pigs as they may think will produce them as many pigs as they may be prepared to rear through the winter for family or market use, and to have this lot of young sows kept in a lot sufficiently close to prevent males from getting to them. Should the grazing on the blue grass or clover not be sufficient to keep them in a good healthy growing condition, I would advise a small proportion of corn, given regularly morn and noon, to assist their regular growth. And as I have, from my own experience with a lot of eleven head, having only ordinary blue grass woodland pasture, made a regular practice morn and noon, of giving them 8 or 10 ears of corn at a feed, I can say with safety, by so doing you will be well paid for your husbandry. Your sows will have health, good sleek coats of hair and good stamina, and they will not be hurried in their growth, then the animals will be much more capable of propagating. Young sows kept in this way will weigh from 120 to 160 lbs. when about 8 months old.

Sows are susceptible of conceiving when 4 or 5 months old; but for better size and form, I would recommend not to breed them until they are about 8 months old, that their first littering will be when they are about 12 months of age. Sows impregnated from the 20th to the last of December will bring pigs from the 10th to the 30th April, as the period of gestation is about 112 days. I have a number on record of the above age, and find their produce to be from 8 to 13 pigs a litter. I know the usual wants of the farmers, by hearing them frequently observe, by their fire side, "let me have my stock of pigs to come the first of March," and at the same time, unconsious of the danger of severe storms and bold blasts in March—and the little economy they have in providing shelters for their sows—frequently lose there entire stock of pigs, which is of no small value to a farmer that has his plan laid out to rear a great number of hogs, consequently must buy a stock; or sell their grain at reduced price. I have experienced the loss more than once, to a considerable amount, consequently I have postponed breeding as before mentioned. Thus I have the security of better weather and the benefit of vegetation, which has a good tendency to correct any indisposition in sows, which frequently occurs in animals as well as human beings. They are subject to inflammatory colds, and fever succeeding, dries up their milk, the pigs perish and death intervenes. To insure the farmer a quick and rapid grawth in his lot of pigs, let them come about the last of April, (say 20th) which is far preferable to March pigs, which have sustained much injury while very young. Stunted by frost and hunger, they cannot be well resuscitated by the best of attention afterwards.

In an ordinary way, sows suckle their young in the spring from six to eight weeks, but in the fall the sows frequently wean their young in about six weeks. I would say to make your pigs thrive and grow on without much injury in their looks from weaning time, the better way is to prepare a covered pen for your pigs, and have a hole sufficiently large so they can go in and out at pleasure, and always keep shelled corn by them. Be particular to commence thus feeding when they are about three weeks old, and it will aid the sow in rearing them, consequently they will wean them kindly and grow on without any ill effects which are common to weaning. These pigs will have age and suf-

ficient growth by good clover and blue grass—will winter kindly, which will insure the farmer a regular growth in his lot of hogs by the common mode of corn feeding, or following corn-fed cattle, the excrements they collect from them is equal to cooked or steamed malt. After weaning their litter of pigs, I would advise all the old sows to be spayed, while reduced in flesh by suckling, as the period is most favorable. A careful hand performing the operation in the left side, I seldom or ever lose any of that age and healthy rearing. They will fatten kindly, and make about as much weight at selling time as their brothers of the same litter. You now perceive I do not winter any hogs more than one winter. I can say from experience, that sows with pig, winter better than barrows. They should be kept in a large woodland pasture if practicable by themselves, to prevent any injury from other hogs. Be careful to have a house or shelter to protect them in inclement weather. Continue to select every spring the best female pigs out of your litters, as many as you may think will produce as many pigs as you may want to breed from, and by so doing you may rear your hogs on your farm at a moderate calculation of 20 per cent over above the prevailing practice of the day. As in the common way the farmer has his males and female running together at large, then they may expect to have litters of pigs every month in the year; the uneveness of the lot of hogs and consequently the stronger will be certain to abuse the weak (a hog is a hog by name and nature) and having masterly strength and in all cases the weaker are driven from their food and comfortable shelter in the forest; and in many cases we have a proof of the uneconomizing rural system of our farmers by having all sizes and ages. In our usual winters we see the small class of hogs, when pinched with cold, deep snows and wet weather, fall victims of death by smothering and suppression by the larger class being with the small ones. On all orcasions hogs ought to be separated and classed according to size, and kept in the woodland pastures where they may provide shelter in the forest foliage. Every farmer should provide himself with hog houses in his wood-land pastures where they can get the foliage of the forest to make their beds. The best place for these houses should be selected on the south or north-east side of a hill, so as to receive the warmth of the sun in the winter, and on a moderate slope so as to drain off the water, and that the sun may the better dry and warm the earth. As to form I am not particular, but always recommend the shelter to be close and dry; to aid in keeping dry much care should be observed, in trenching around the house to turn the water.

Rearing a herd of blooded females swine; spring and summer treatment; breeding and winter treatment.—They should be left in a lot sufficiently large for exercise, containing plenty of water (for wallowing) and shade. If the grazing is not sufficient, I would advise a little corn, dish-water, slops and soap-suds, mixed together, to be given them, so as to keep the animals in a good healthy look, but by no means like fattening, to hurrying them in their growth.

My practice for winter treatment; after my sows are all pregnant, if practicable, I always have a large field of clover or meadow for their grazing, or put them on rye or wheat fields, and let them graze about 24 hours, twice a week, when the snow is off the ground; always providing a comfortable dry shed or houses for them, having a regular time for feeding (morning and evening) and if any animal stands in danger from the want of regular feeding while pregnant, it is the sow; and there is great danger of their being fed too much at a time, by careless or inexperienced servants, which is apt to produce abortions. Another cause is the severe weather on sows, snow and wet weather, when they have frequently to make their beds in the snow, and sometimes in mud and water—when shelters are not provided for them; this is the cause why we so often hear our farmers say all their sows have slunk their pigs, and shall have no pigs in the spring, and another cause still more particular I leave to the careful to observe; when my sows are half gone with pig, (sometime in February,) without fail I separate my sows and put them in lots (4 or 5 in number) to prevent from laying one upon another along in February and March cold snowy spells, which causes them, by oppression, to miscarry. This is the time that the greatest care should be taken with sows, as the period of littering is close at hand, for if they should miscarry, you have again to breed them, when their pigs will come late and much time lost.

Breeding of blooded sows.—When they have attained to the age of eight months or thereabout, my practice is to breed them between the 1st and 15th Dec., so as to make their littering to the latter end of March, and by having shelters or houses for their littering in, I can venture breeding sooner than I would otherwise advise. I can rear this litter and have my sows stinted to boar, and bring the second litter in and about the 1st and middle of September, so as to have time to rear them and so they will stand the ensuing winter. Then my sows can have about a month's rest until the 1st Dec., which I very much approve of for breeding again, and by so doing I have three litters in the period of 12 months. You now see the months I prefer for my blooded sows to litter, end of March and the 1st of April. The second litter from 1st to 15th Sept., and the 3d litter the latter end of March and 1st of April, which makes the period I have noticed. In stinting my sows to the boar according to the time mentioned, I have been very particular to aid my memory by committing to writing the time when they were stinted and the mode of stinting. I was in the habit of the old custom in my first beginning of doing business in this way. I soon saw there was an error some where, and my intentions were defeated some how—as I would reserve my lot of common sows to be bred in December, so as to bring the pigs the 1st of April when the weather was warm, and the old custom would be to let the boar go with some twenty or thirty sows, with the expectation of having a lot of pigs of one age, and in a common way there would come in season at one time in all probability one-third of the sows. Admit the boar to be in good health and a full flow of animal spirits and strength, he will soon by severe service be impotent, and consequently only the first few sows may be impregnated. The sows will in all probability continue to come in season, and the boar still reducing every day, and yet his lasciviousness keeps him incapable of being fruitful. Hence, I found by experience my sows were unproductive, some having two or three pigs, and they coming in much later than I expected, consequently I would re-

commend one boar to every ten sows, where you want all your pigs of one age and of good size. Of all the animal creation that I have any acquaintance with, the boar and ram will lose their juices faster from gendering. I will aver that a boar may be in good health and high condition of animal spirits, and just let him with a lot of sows twenty or thirty in number, and in four weeks time he will lose one hundred pounds weight, and you may feed him with what corn he may want to eat.

My young maiden sows, I hardly ever permit to be served but one time; my reason for this is that the old boars are too heavy and strong for them; he mashes them down when they are willing; if not, he hunches them with his nose, and bruises them so much, that it impedes their growth forever afterwards. It is astonishing to think how they frequently support them. I disapprove under any circumstance of letting the male to a sow more than once when he is in good order. I recommend an aged male to maiden sows in all cases to secure large, sprightly, and well formed pigs, and more prolific. I have kept a true account heretofore of this practice. I let a lot of seven sows run with the boar until they have done with him and kept their several dates. I also had a lot of young and old sows. I let the boar out of his pound and let him serve them once a piece and kept their several dates. There was but one out of six that did not stand, and out of the lot of seven, there were two which did not stand. The lot of six produced from six to eleven pigs a piece, and the lot of seven did not produce as many pigs by four as the six. I kept both lots in the same manner with care, and they answered their several dates in littering, the period of gestation being about sixteen weeks. If you stint your sows to the boar only one time and you keep her in a lot to prevent other males, and she stands, she will be very sure to bring forth from 111 to 113 days; but if permitted to run with the boar when she is in season until she is done, I have recorded a number of instances and dates where they have varied from the set time of 111 to 116 days. This convinces me of the injury the boar sustains, and the sows receive no benefit. From his masterly strength she is constrained to do what nature does not desire, therefore the great discrepancy in the supposed period of gestation.

Particular feeding.—I always give my sows dish-water slops when practicable through the winter, in a trough, sufficiently long that they may all feed out of it without scuffling, with a pole confined on each end of the trough, and also to keep their feet out of the slop and keep them from fighting and slipping over the rotundity of the trough. The ammonia in the dish water will suit impregnated sows much better than strong salt. I had twelve head last winter in the severest weather and deep snows; I never gave but three ears of corn to each head, morning and evening, and when the snow was off, my feed was from one to two ears to each head, morning and evening.

Treatment.—When in some two or three days of their littering, I always separate my sows and put them in sheds or houses by themselves; I prepare leaves for their beds (if practicable) as I prefer them to straw or hay; they are light and warm and there is no danger of the young pigs getting entangled, as they do sometimes in straw; being very weak, they die before they get to the teat; now whilst confined before littering, give them two ears of corn morning and evening, and a plenty of water until they have farrowed. After they have littered, give nothing but water for 24 hours; then give two or three ears of corn night and morning, for some four or five days, never give rich slops for some four or five days before and after littering, for they are not in good health, but feverish, &c., and rich food will increase the fever, swell the teats, so that the pigs cannot draw them, more especially in warm weather. I have known instances of the milk entirely drying up from fever, and the pigs die for the want of it. Our affection frequently takes precedent of reason, by giving in to supposed calls of nature, therefore many feed their sows on the richest food immediately after littering. It also produces that very injurious disease among the pigs—scours.

Treatment after the pigs are some five or ten days old.—The sows should be kept separate from each other at least ten days after littering to secure the pigs affections to their own mother, and to prevent them in large herds of pigs from this evil, which is so common when the sows are permitted to run and litter together. The strong pigs will suckle all the sows, for their superior strength will force the weaker and younger from their teats, and consequently soon become puny and weak, which if kept as I have described, has a good bearing to prevent them. I can say from experience that every pig will have their own teat, and regularly as the sow calls or permits them to suckle, they will return to their own, unless forced away by the stronger. My practice is, after they have arrived at the age before mentioned, to put them in a lot of grass sufficient for their grazing and exercise, with a plenty of shade and water, if practicable, and always keep other stocks of hogs away from them of any size, for the purpose of keeping the sows from fighting, and running over and crippling the young pigs, which is pretty generally the case if they are permitted to feed with the sows and pigs. I feed my sows while suckling with as much corn as they will eat up clean, and always if possible put the corn on smooth and dry ground for them. As for economy, from experience, I can say I am well paid for my husbandry, to have houses and sheds for winter feeding. My summer and fall feeding of slops to my sows while suckling their pigs is done in the following described manner:—Have two barrels or tubs placed convenient to the troughs, then put into each barrel two pecks of rye and one peck of corn meal, one of wheat bran, then fill the barrels with kitchen slops and soap-suds, when not enough of this, make up the deficiency with water, frequently stirring it with a paddle, and in 24 hours by a summer heat it will be about as acid as common still beer. Commence slopping out of one tub the first day, leaving some of the slop in the tub to retain the acid for quick fermentation; the same evening fill up this tub again for the third day; now commence slopping the second day out of the tub, and re-fill in the evening as you did the first; now you have both your tubs fermented and a body of acid in them, you must keep it up by filling one every day; renew the meal and bran every two or three days by putting in one peck of the three kinds mixed together in each tub, in the same proportion to the first put in. From this quantity I fed five aged sows and thirty-one pigs three times every day, which took

about twenty gallons altogether, leaving in the tub about 12 gallons to fill up on. I continued slopping them in this way for seven weeks, which was about weaning time. In this time they consumed about twenty bushels, and at an average cost of 50cts. per bushel, they cost $10 expended in meal and bran. From these pigs I sold $310 dollars worth, leaving me some five or six pigs on hand.

Description of the Russia Hogs.—Their color is generally white, with long coarse hair, their head is long and coarsely featured, their ears are not so broad as the common variety of the country, yet longer and narrower, and come regularly to a point, projecting forward, and they do not appear to have so much command of them as other breeds; they have fine length and height, their bone is large and fine, they stand well upon their pastern joints and trackers: quite industrious; they are thick through the shoulders, indifferently ribbed, (or suddenly inclined down) their plate or kidney bone rather narrow and ovaling than otherwise, hams pretty good, though not so good as the Irish, Bedford or Berkshire, yet preferable to the variety; they do not graze so well as many others; they want more time to bring them into market than the above named breeds. Give them from 18 to 20 months age, they will make very large hogs; they are quite prolific, their usual number is from nine to twelve pigs a litter. I have found their cross with the named breeds to be a valuable acquisition to their grazing, aptitude to fatten, and rapid growth at the same time.

Rearing, treatment and management of thorough bred male hogs.—To ensure good size, form and fullness in their hams, straight in their stifle joints, and to give a good and regular growth, I seldom or ever suffer my boar to serve a sow until he has arrived to the age of 8 or 10 months, and older if possible. I give them a lot sufficiently large for exercise, and give food enough to keep them in a high state of flesh while growing; by so doing, I have no fears, from past experience, of injuring their libidinous propensities as so much objected to by aged men, who pretend to be hog growers in Kentucky. By this mode, I am satisfied that you will have stronger, more vigorous, active and regular sized pigs in every litter; and further more, you will find your sows in littering are not so apt to produce pigs dead, *fitty* and feeble, as when got by a young or poor boars. In this way I breed them, and, according to my former view, never suffering them to run at large with spayed sows, &c. I believe by this treatment they will be good producers for ten or twelve years, if not longer. They are dangerous animals, and should not be permitted to run with horses and cattle.

This is the practice that I have adopted, and shall follow unless I see some further information from the pen of some other writer upon the subject. I am always open to conviction, and willing to receive instruction, and will not spare time, trouble and expense to procure correct principles. I should be pleased to see some writer who has the weight and benefit of years and experience on his side, that I might look up to, as a son to a father, for further information, as I am but yet in the morning of life. I feel much delicacy in coming out in the columns of a public agricultural work, but still, from solicitation, and as a friend to the cause of agricultural pursuits, I have ventured. We find recorded in the book of Genesis, chapter 3d, verse 23d, one of the first commands that God gave to man—"to till the ground from whence he was taken."

JAMES E. LETTON.

Millersburg, Ky.

ON OAT PASTURE AND IMPROVEMENT OF SOILS. BY WILLIAM YOUNG OF DELAWARE.

From Memoirs of the Philadelphia Agricultural Society.

Rockland Farm, March, 9th, 1810.

Sir,—In compliance with your request, made a considerable time ago, I have inclosed a narrative of the *oat pasture;* and several circumstances under which it has been introduced, with immediate advantage to the live stock and worn fields.

I have endeavored to copy it from the fields themselves; I have however, designedly as it were gone back, to give another view, of some circumstances which are deemed important, and not with a view to overcome your patience, but to remove doubts, and introduce the experiments before you, in a different point of view. The inferences respecting the advantages, or use of the oat pasture, have been, and still may be, deemed a whimsical expedient to spend money; it may be ridiculed by others. But as it has outlived, and overgrown every thing of that nature here, there is some hope that it may become indigenous elsewhere: it has been weighed for years under hopes and fears. Not that I dread criticisms, made under circumstances which offer a hearing, in a private, and before the public tribunal, on equal ground, foot by foot with the critic. It would give satisfaction to convince, or to be convinced. Improvement is the goal towards which I bend my course. If a new path shall be pointed out, and which has with greater advantage been trodden for several years, and with a greater number of simple facts to recommend it, it will be cheerfully followed. Otherwise the course now beaten by some years experience, cannot be abandoned.

I am most respectfully yours,

WILLIAM YOUNG.

GEORGE CLYMER. ESQ.

Vice-President of the Philad. Soc. for promoting Agriculture.

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It is generally acknowledged, that the best land may be reduced to sterility, from an injudicious rotation of crops. It remains in a great measure to be proved, whether a farm. which from bad management had been rendered barren, can be restored to its pristine fertility, by a treatment not beyond the reach of every farmer, (nor without the farm,) who possesses the land, free from incumbrances, which are nearly equal to the supposed value of his worn-out farm.

When an inquirer examines the publications of those who have given the results of their experiments, it appears not only practicable, but easy: frequently however, some circumstance is not mentioned in the communication, or something not attended to by the reader, who intends to make the same successful experiments, but fails, from the causes stated.

The Rockland farm exhibited a subject for experiment, as it had not only been reduced by cropping, but generally, become a common for every

animal, to take what remained of the scanty natural, but coarse herbage: having read in various books the result of sowing plaster and clover, it was presumed, that sowing plaster and clover would be the extent of the expenses required to fertilize the fields, in a few years;—a few experiments proved that the plaster and clover seed were both lost, as no one could at any season of the year, point out one field, or upon what part of any field they had been deposited, unless where the briers and bushes had been eradicated.

It should however had been mentioned, that the soil was generally a cold or heavy clay, some blue, white, light brown, and a few spots of red clay, loaded with hard blue stone and rocks, chiefly quartz, mixed with iron and copper. Some of the experiments were made with plaster, others were made by top-dressing with lime, at the rate of twenty-five or thirty bushels per acre: the lime was brought 20 or 25 miles from the kiln, and laid on the field at 25 cents per bushel: it was formed into a bed of about half a foot thick, and covered with earth ploughed and thrown over it, before it was slacked, that all the phosphoric principle disengaged by the water, might be united with the earth which covered it; a heavy harrow was afterwards passed over it, so soon as the shell was reduced to powder; the bed of lime and earth, was then frequently turned by the plough and harrow, until the whole assumed, the appearance, and smell, of soapers ashes, containing about ten parts of common soil, to one of lime. It was then carted, and spread regularly over the field, and in every instance it gave a return of clover, equal to ten loads of stable manure to the acre. The idea of mixing the lime and earth, was suggested from spreading the refuse mortar of lime and sand gathered from about buildings, and laid upon the field, the effect of which I observed was more immediate than any equal quantity of lime: though mixtures of lime and earth, were equally so,—in both cases, the lime was completely pulverized, and the sand and earth, broke up the communication of lime with lime, and the succeeding rains carried the fertilizing principle of the lime, as from a sieve, into the soil where it was spread,—it completely divided the soil, rendering that open and warm which before was compact, and too cold for the roots of the grain to live in.

The whole soil which before felt dead under foot, became so elastic that persons of observation by walking over the field in the night, distinctly told how far the lime and earth compost extended. The color of the soil was likewise changed into that of chocolate.

These effects presented several ideas, which had not occurred to me before: viz. That any thing which would separate the particles of the soil and admit the air, would render these cold and heavy clays, warm and fertile;—that the free intercouse of air, would carry off the acid; to meet this, ploughing in the fall was adopted, and found successful; one half of a field six years ago was ploughed in the winter, the other half ploughed in the spring; that part which was ploughed in the spring, has never brought grain, or grass, equal to the other. It should have been observed, that the field had not been ploughed for upwards of 20 years, and of course a great body of rubbish and roots were ploughed in, after the brier-hook and grubbing-hoe had smoothed the surface. Spreading of manure in the autumn, from the compost bed, has also been introduced with universal success, both upon grain and grass fields, the lye or salts, of the manure, being carried into the soil by the rains upon the breaking up of the frosts which have in some measure prepared the soil to receive it. High agricultural authorities, even bottomed on accurate observation, are opposed to the practice of spreading out manure in autumn; amongst these we find the justly celebrated Lord Kaimes, in his 'Gentleman Farmer' a work upon first principles, and deservedly of the highest authority. A departure from his judgment is only to be allowed, where facts would censure silence; nor should his name have been mentioned, unless to avoid the charge of writing without attending to what has been said on that subject; it is no conclusive objection that "the strength of the manures will be carried off by winter rains, or exhausted by the frost:" are not the warm showers more so, and are not the exhalations more copious in a warm than in a cold temperature; is the descending of the sap in trees no monitor, as to the season for spreading out manures, and about the operations of nature, for renewing, and invigorating, the process of vegetation.

Brier bushes, and all vegetable substances have been covered up with earth, rotted and used with the same success, as stable manure, and so far, and so long, as they separate parts of the soil and admit the air, they fertilize and change the color of the mould. These experiments tested by frequent repetition, have laid a foundation for experiments less expensive, and equally fertilizing, for the production of grass, and grain. *Ploughing and sowing, for the purpose of producing pasture and accumulation of vegetable soil, have been adopted:* for this purpose wheat, rye, Indian corn, (maize,) buckwheat and oats have been sown upon fields ploughed, which were incapable of producing any crop; none of those grains, have produced pasture and vegetable soil equally valuable, to that from the oats; where the others have failed, its roots have *pierced, disarmed,* and *vanquished* the *inhospitable soil,* and rendered it fertile; the winter ploughing is continued, and the oats are thrown in, as early as the season will allow, sometimes even in February, either upon what has been ploughed in autumn, or in the fields which were in corn the preceding fall. In general they afford early pasture, and when they are reploughed in July and August, and sown again with oats, they furnish excellent pasture from early in September, until late in December, during that season when all other pasture is generally dried up. The first sowing of oats only gives about two months pasture, but the roots and remaining herbage afford a manure for the second sowing, and this always yields four months valuable pasture,—which no other course known to me will afford—in September, October, November and December. Considerable attention is required to preserve the young clover, which the field will be able to raise in the second year of the oat pasture: if sown with the oats in the spring, the cattle should never be put in while the ground is too moist, as they would destroy and tread it into the soil; and sometimes dry seasons are also highly injurious to the clover. When the clover is sown with the second sowing of oats, the same care is required to prevent its being trodden in by the live

stock for this purpose it is always necessary to have a spare field of oat pasture, which they will feed upon in wet weather, and which they would not relish in dry weather. To guard against a dry season it is most proper never to pasture the oats, where the clover is sown, so much as to prevent the herbage of the oats from giving shade to the clover. So soon as the field will produce clover luxuriantly, there is no farmer at a loss how to make his field as rich as he pleases, and having got them into good heart, it will be his interest to put them in such rotation, as shall increase the vegetable soil and consequent fertility of his fields.

It is almost unnecessary, to mention, what will make its way to the understanding of every farmer, viz. the many advantages gained from treating his barren field in this way.

1st. Early and late sweet pasture from such fields, which otherwise produced a scanty coarse herbage, unpalatable to every animal.

2d. Immediate reward for his labor; the stock are supported by it within two months from the time seed is sown: the two returns give six months green food; he is not however to depend upon it for all his summer pasture.

3d. Perhaps it is one of the most effectual means to root out garlick, because what have escaped the plough in the spring, are eaten down with the pasture from the first sowing of oats and prevented from going into seed: the ploughing in July and August expose so many of its bulbs to the sun, that few shoots are to be found in oats sown for fall pasture.

4th. It is an easy and profitable way of clearing grain fields from every species of injurious weeds; as it will convert them into vegetable soil, and enable the farmer to raise whatever grain or grass he shall judge most suitable to the soil.

5th. It will save the expense of a fruitless summer fallow, and the green herbage will aid the dairy.

6th. It enriches the farm from within itself, and no expense is required beyond the reach of any farmer: by rising one hour earlier, and working one hour later than usual, for two weeks, he may plough, and sow two acres, as an experiment. The pasture will recompense his labor, while his soil is greatly improved; it is equally evident, that the fertility of the soil is acquired, partly from the roots of the oats, opening the soil and introducing the air, and warmth of the sun, and partly, from accession of vegetable soil produced from the decomposed roots of such pasturage; but even before the roots are converted into soil, they produced the most beneficial effects. Those from the spring sowing, retain the moisture, and supply the summer sowing with it. The roots from the fall pasturage, being full of sap, introduce winter frosts every where, into the soil, which swelling with the congelation, separates the particles; for it is to be observed, that roots while the stem is eaten down by the stalk, do not become hard, but are more numerous, than when the plant is matured into grain. It is however necessary to sow at least double the quantity of seed, to that required for crops of grain, the pasture being so much the thicker, and the increase of vegetable soil from the decayed roots so much the greater.

It is to be expected, that one or two repetitions of the series of oat pasture, will make the soil equally rich as a common dressing of stable manure, which from a farm of 100 acres, will not in general extend over more than 10 or 15 acres: this gives to one acre nearly the vegetable soil produced from seven or ten acres. It is to be remembered, that the object proposed was to render worn-out, or barren fields productive; and in no case have I found a field, which was not after two years oat pasture, capable of producing clover and receiving the gypsum with evident advantage. So soon as a field produces clover, no one is at a loss how to produce advantageous crops afterwards. It is in every one's power to estimate what the ploughing and seeding per acre of oat pasture will cost, and according to circumstances, so will the expenses be; but in general where the expenses are high, the value of the pasture is equally so, and if even granted that the cost of ploughing, and seeding, shall be double in value to the pasture produced, let the comparative value of the field be fairly estimated, before the course was begun, a waste, or worn-out field, and what it is now, when the course is completed, and laid down in clover, timothy or orchard grass.

It will be of the first importance to have at least two fields; otherwise if the cattle are constantly upon the same field it will not be found so productive, and in wet weather, they should be turned into some field where the herbage was too hard in dry weather. It will be eaten greedily by the cattle after they have been satiated with the soft blades of the oats; under this management, beeves have been fatted for family use and taken off in December, without any grain. It is observed that the oats scour at first, but the free use of salt readily corrects the complaint, and in no pasture do they rise faster in flesh; and the juices of their meat are uncommonly grateful.

The fields which have been in corn the preceding year have also been sown in the spring; without being reploughed, and have done equally well, except upon heavy clays, when the spring has commenced with heavy rains, which have rendered the soil too compact to be opened, even with a heavy brake harrow, drawn by four horses. The fields from the oat pasture the foregoing autumn, have also been sown, without reploughing, when the spring has set in without much rain, after severe frost: not only the oat pasture, but also the clover sown therewith, have answered well.

Oats have also been sown amongst the hills and drills of corn, after it has received the last dressing. It has succeeded, without any visible injury to the corn, provided care has been taken not to injure the roots, by the plough or harrow at the time the oats were sown.

It has been inquired, are not all crops of oats exhausting, if so, how can two sowings of oats in the same year, render the soil fertile? It is granted if oats shall be matured into seed, they will certainly exhaust; but if cut off, while in the blade, they, and all culmiferous plants, will fertilize. The experiment was made with Indian corn, sown broadcast, cut twice and carried to the stable, and a crop of turnips taken off the ground the same season: the manure was laid on before the corn was sown, but none was given when the turnip seed was put in.

Another way in which oats fertilize, appears to be from increase of vegetable soil; this is within the view of every observer; the remains of the pasture ploughed in, particularly in July and Au-

gust is speedly decomposed, its tenderness and moisture aiding the dissolution. But dry stubble and husk roots are difficultly decomposed, nor do they produce so much carbonic or coally matter in the soil, which chemists say decomposes the water, and produces the air required to promote vegetation. As the vegetable is produced from air and water, and not from earth, which seems to be no more than a laboratory where the process of vegetation commences, and finally serves as a matrix to hold one part of the plant, while the other parts are raised aloft, in quest of superior aid, to complete the inscrutable operations of the vegetable fabric.

It has also been inquired, will this process of oat pasture fertilize every where? It is answered, that where the soil and climate are the same, the effects will be the same also. A description has been given of the soils, where the experiments were made, and are still going on. If experiments of the same nature shall be made upon a different soil, and climate, the result will be different, and more or less favorable, according to circumstances, and for which the practice now mentioned cannot in justice be rendered accountable. If my shoe fit my foot, I am warranted to say, it will suit a foot of the same size, and shape every where; let no one conclude, that it will fit a foot of larger or less size or different form; but I must confess that passing over things equally obvious, I have run into numerous and expensive errors.

But when it is inquired upon what evidence it is to be received—the reply is at hand, living evidences, are at the command of every one who chooses to make the trial, let him however, be on his guard, against suffering himself to take a crop in place of the spring pasture oats.

If it shall still be inquired, how does the oat pasture fertiliz'? It may be also observed that the constant verdure and green herbage prevent the rays of the sun from parching the soil and depriving it of its moisture and air, both of which are highly necessary to vegetation. The double portion of juicy vegetable matter arising from the two crops of pasture in the summer, being every where united with the common soil partly mechanically and partly chemically, renders the soil capable of retaining sufficient moisture and elastic air, to make it open and warm, and by which the soil does not only become thicker by going downward, but actually expands, or rises. so as to give a furrow, considerably deeper than formerly, over immoveable rocks. Some years ago, a field in view of the farm-house, marked the broad rocks, during the course of every crop; they are now covered with so much soil, that they are seldom observed. The two ploughings also contribute to the increase of the the air in the soil, without which no soil can be fruitful, there being no vegetation in vacuo. Tull's horse-hoeing husbandry was introduced under the idea, that the *pabulum* of plants was pulverized earth; the fact daily before us is, that pulverized earth retains the *moisture* and *air*, as the handmaids of vegetation. Some experiments have lately been made, the results of which favor these remarks, viz. "that *soils* afforded quantities of *air* by distillation, somewhat corresponding to the ratios of their *values*."

Inclosed I have sent soils in the state they were found, before the courses mentioned were introduced.

No. 1. A sample of the unimproved soil about three inches deep.

No. 2. A sample of the same soil four inches deep, improved by the lime compost two years.

No. 3. A sample two inches deep from the field in its exhausted state.

No. 4. A sample three inches deep from the same field, which was once sown in pasture oats, and has been one year in grass sown after the oats, which did not take well, partly owing to the late season when it was sown, and partly owing to the seed having been injured, and the soil still cold.

No. 5. A sample two inches from an exhausted field.

No. 6. A sample four inches from the same field after pasture oats, which was followed by wheat, a poor crop, succeeded by oats, a middling crop, with clover which yielded a considerable swath last season; when the clover is ploughed in, it will be followed by pasture oats.*

HORSES SLABBERING.

From the New England Farmer.

Various opinions exist as to the cause of the excessive salivation that horses sometimes undergo, and which must detract seriously from their strength and ability to labor, as well as from their comfort. Some have supposed it to result from the second growth of grass that makes its appearance in July or August, the *euphorbia macalata* of the botanist; some to the second growth of red clover, some to the web of the spider that is spread so extensively over the latter feed of summer, and some to the action of the lobelia. We have had little doubt that it was to be attributed to this last cause, always feeling safe when our horses were in pastures where no lobelia existed, and when afflicted by it, finding them to be speedly cured by removing them from the fields in which it is to be found. In an Augusta (Me.) paper we find the following, which would seem to go far to confirm the belief that salivation is sometimes at least caused by this pest of our meadows and pastures.

"Our own family jade—a hearty kind old creature—has not enjoyed the luxury of grass for three years, and has always been kept in good trim on hay, with very little provender. In July we had the barn filled with her year's stock of hay, sweet from the field. Soon after the horse began to eat it, she commenced slabbering abundantly. Being quite out of patience, we set our wits to work to

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* The samples of soils sent by Mr. Young, exhibited the most marked difference. The progress from absolute sterility, to rich mould, might be traced by the appearance of color in the several parcels. I with great pleasure bear testimony on the subject of Mr. Young's improvements. In the years 1806 and 1807, I saw cattle feeding in good pasture and good crops of grain, and grass sowing in fields, which in 1814, I thought totally irreclaimable from briers, garlick roots, and original poverty of soil. Where manure is at hand, and capital in the possession of the cultivator to purchase it, any soil may be rendered fertile; but Mr. Young affords the best example of good farming, viz. enriching a naturally poor soil, and restoring fertility to exhausted land, by returning thereto its own produce raised with the least possible expense. J. M.

ascertain the cause. Some told us it was white clover, some said it must be lobelia. On making strict examination, we found that the last load put into the barn, had much lobelia, and but little white clover in it. As an experiment, we, for several days in succession, previous to feeding, were careful to cull the hay by handfuls, and pick out the lobelia. From this moment the slabbering ceased. On giving the hay again without picking it over, the salivation began again. So that we are satisfied that lobelia is the cause of slabbering in horses. Can any one tell us what will cure this slabbering, without the pains of separating the lobelia from the hay?"

PLOUGHING AND PLOUGHS.*

From the Boston Courier.

Ploughing is considered by all farmers as the most important agricultural operation, either as it regards the immediate crop, or the future and permanent improvement of the soil. The farmer who so manages his field as to produce, in the main, the greatest reward for the labor and expense bestowed, will undoubtedly be considered as acting with a sounder discretion, than he whose sole object is a present crop, without regarding the permanent improvement of his fields. To deepen the soil, by bringing to the surface, at each successive ploughing, a portion of the poorer sub-soil, and thereby exposing it to the enriching influence of the atmosphere, and to cover up and preserve from washing rains and wasting winds, the light vegetable matter upon the surface, as well as to facilitate the subsequent operations of the husbandman, are the only important uses of the plough.

Our old fields are rapidly approaching to a state of utter sterility. At each successive rotation of crops, the vegetable mould is becomming thinner, and the product less; and the plough, in the hands of most farmers, so far from deepening the soil, and increasing its powers of producing, is really exhausting it of all its natural fertility; and will soon render it, as has already been done in some parts of our country by the same means, an unproductive waste, unfit for cultivation. The rich treasure, which our forefathers found upon the surface, which had been accumulating for centuries, has been squandered with a prodigal hand. The apparently inexhaustible deposite of vegetable food, which covered the land, has, by an improvident use of the plough, been given to the four winds of heaven, or washed away into the ocean. They have ploughed, cross ploughed, and harrowed, till their descendants have little else left than a mere *caput mortum*.

I have known rich swells of land in Maine, which thirty years ago, were covered with thick forests, and what would have seemed an exhaustless store of food for vegetation, by means of the plough robbed of every particle of vegetable sustenance, and now absolutely abandoned by the occupant as worthless.

Strange as the assertion may seem, it is nevertheless true, that farmers generally plough too much. The poorer sub-soil, which is turned up by the first ploughing, instead of being kept upon the surface, till it has become enriched by culture and exposure to the air, is by cross ploughing immediately turned back again into its cold and lifeless bed; and the light vegetable mould, instead of being keep beneath, for the benefit of the crop, is, by the same process of cross ploughing, brought again to the surface, and blown away by winds, or washed away by rains.

The manner of ploughing, and kind of plough, which is used by most farmers, have also a tendency to dimmish the natural or acquired fertility of the soil. With ploughs but little differing in construction from common wedges, the ground is not turned over, but crowded into ridges, or the furrows lapped upon each other in such a manner as to expose much of its best properties to waste. The writer has ascertained from actual experiment, that on an acre of land yielding not more than a ton of hay to the acre, at the usual season of ploughing greensward, say the tenth of May, contains more than twelve tons of vegetable matter, consisting of the roots and tops of grass, and other vegetable remains upon the surface. Such a method of ploughing then as will be best calculated to secure, for the benefit of the crop, this mass of enriching substance, the farmer should not hesitate to adopt. By completely inverting the sward, and laying it as flat and smooth as the nature of the ground will admit, and then cultivating the sod with the application of a light dressing of compost, land may not only be kept in heart, but wonderfully improved. With one ploughing in this way, and spreading on one top-dressing of compost manure, of about twenty cart loads to the acre, and mixing it finely with the poor earth at the surface, I have raised two crops of grain or roots, and laid the land to grass. In the ordinary way of cultivating, four ploughings, as many times harrowing, and two dressings of manure, are considered necessary. I have then saved three ploughings, and as many harrowings, one dressing of manure, and at the same time have deepened, and permanently improved the soil, and more than doubled my crops. Ten years ago, I was upon the point of abandoning some of my old fields in despair. They had been cultivated in the usual mode of ploughing, cross ploughing and cropping, alternately under the plough, and in grass, and had become so impoverished, that the products were insufficient to cover the expense of cultivation. The same piece of land which gave me one ton of hay, will now at the same distance of time, after laying to grass, give me three.

In the cultivation of land, which has been a year or more under the plough, nearly the same course is to be pursued, especially when it is intended to sow wheat or rye; plough your land so as to turn under the rich mould, bring to the surface a portion of the fresh earth, that has never before been disturbed by the plough, and mix this well, (if the preceding crops have not been well manured,) with a light dressing of well-rotted compost, and from twenty to fifty bushels of slaked lime to the acre, and I am confident you will never require a legislative bounty, as an inducement to cultivate wheat.

Good ploughing cannot be effected without ploughs suitably adapted to the purpose. In this all-important agricultural implement, I venture the assertion, without fear of contradiction, that the Americans have made greater, and more useful improvements, in its adaptation and fitness for the

*The auther of this paper is E. Phinney esq. an account of whose farming was inserted before—Ed. F. R.

designed purpose, within the last twenty years, than have been made in Great Britain for a century. From a conviction of the indispensable necessity of good ploughing to a successful tillage, near twenty years ago I persuaded the person who occupied the farm I now own, to send to England for an improved Scotch plough, (I think Small's,) which was highly recommended in the agricultural publications of that time. This was before the introduction of the cast iron plough into this part of the country. The plough came, and I must confess I was greatly astonished at the first sight of it, and as much disappointed when I witnessed its operation. A huge, misshapen combination of wood and iron, it was the laughing-stock of my neighbors, who at once denounced me as a "book farmer." The plough was laid aside, and has been kept for show, and in construction and workmanship, when compared with American ploughs, furnishes a striking illustration of the superior skill and ingenuity of our own mechanics, over those of Europe. I can now do twice as much work, and do it infinitely better, with Prouty & Mears' improved plough, with one horse, and a single hand, than a yoke of oxen and a horse, and one additional hand to drive, could do with the famous Scotch plough.

Public attention was first awakened to the subject of improvements upon the old-fashioned, wedge-like plough, by the writings of Mr. Jefferson, who, in 1789, published his new theory of the construction of the mould-board, formed upon mathematical and philosophical principles. It was in consequence of a suggestion from him, that Robert Smith, of Pennsylvania, in 1803, substituted the cast iron for the wooden mould-board, for which he obtained a patent. This was the commencement of a series of improvements which have resulted in the substitution of cast iron for all parts of the plough, except the beam and the handles; and such has been the progress in reducing this implement to a fitness for the purposes designed, that the American cast iron plough, as now constructed, may in truth be considered, as it has been denominated, the most important instrument known to man. About fifteen years since the cast iron share came into general use in this part of the country, Wood's, Tyce's, Hitchcock's, Howard's and last of all Prouty and Mears', have each had their share of public favor. I have particularly attended to the operation of all these, and noticed the defects and excellencies of each. About twelve years ago, Hitchcock's plough, then in general use, and highly approved by the farmers of New York, was introduced into this state by Mr. Prouty, who was well acquainted with the practical use, as well as the construction, of the plough. His science in agriculture aided by his mechanical skill, from time, to times suggested to him various and important alterations and improvements in this plough, and about two years since, Prouty and Mears obtained from the government a patent for their "improved cast iron plough."

The prevailing difficulty with all ploughs, with the exception of the last named, is, that the force necessary in the draught, is not applied directly to the centre of resistance. Writers on this subject, as well as practical farmers, have erred in their notion, that the beam should be placed directly over the land-side of the plough, and that the cut of the coulter, or the position of the standard, should be square, or at a right angle with the cut of the share, thinking that if the share and coulter make an acute angle on the land side, the plough will incline to fall to the right. This would be the tendency, unless the other parts of the plough are so constructed as to resist and overcome this inclination. By so placing the coulter as to form an acute angle with the plane of the share, on the land side, the beam is brought more directly over the centre of the plough, as is the case with Prouty and Mears' improved plough, and thereby the power necessary to move it, is applied more directly to the centre of resistance, and the force required to move it, and overcome this resistance, is of course less than when applied on one side. I cannot better make my self understood, than by supposing the land, or left-hand side of a harrow, to be kept on a straight line with the line of draught. It will readily be preceived that the force necessary to draw it, when so placed, will be greater than if drawn in the usual way, by applying the draught to the centre. This is decidedly one of the most valuable improvements in the construction of the plough, that has been made in modern times, and for which the public are indebted to the ingenuity and skill of Messrs. Prouty and Mears. A greater ease of draught is not the only advantage resulting from this improvement. Another and perhaps greater benefit is its perfect adaptation to the end designed, by leaving the ground in the best possible condition. The acute angle, which is made in the land side of the furrow slice, by the peculiar construction of this plough, enables the ploughman to lay the furrows together, like feather-edged boards. This, in greensward, is very desirable, as the grass is thereby prevented from springing up between the furrow slices much more effectually, than when the furrows are cut at right angles. The grass is completely shut in, and will not rise to injure the crop, or increase the labor of cultivation. Not only in green sward, but in old ground, the superior manner in which the work is done by this plough is very perceptible. There is no tendency to crowd the ground into ridges; the soil is taken up, as it were and turned over, and left loose, and in the best state to derive vegetable aliment from the air, and to enable the roots of plants to penetrate, and strike down in search of food.

Another advantage attending the peculiar construction of Messrs. Prouty and Mears' plough, is its durability. When the resistance is all upon one side of the beam, there must be a constant tendency of the plough to the left, or land side; the friction is thereby increased in this part, and the wear, of course, is greater: but when the beam is placed more over the centre of the plough, and the resistance which it has to encounter is upon both sides of the beam, its movement is more regular, and the friction equal in all parts. These are some of the peculiar properties of this plough, which give it a decided preference to any other now in use. On conferring with some of my neighbors, relative to the work of Prouty and Mears' plough, it is believed, that in ploughing a field of ten acres, the amount of labor saved, added to the amount gained in consequence of the improved tilth, when compared with the work of any other plough, is fully equal to the price paid for it. E. P.

Lexington, (Mass,) March, 1838.

MISTAKE IN THE CULTURE OF THE BEET.

From the Farmers' Cabinet.

I am one of the root raisers—growing sugar beet, mangel-wurtzel, ruta-baga, and potato for feeding stock. And as farmers may, in my opinion, be as useful to each other by reporting their mistakes and failures, as their success, I will mention that my beets were flourishing, and the admiration of the public passing by them as late as the first week in the seventh month (July.) But the weather becoming hot and dry, and the ground harder than I liked, I concluded to run the cultivator through them and loosen up the soil. The consequence was, instead of improvement, the leaves began immediately to wilt, curl, and the edges of them to die; the mangel-wurtzel worse than the sugar beet; but all declined from that period until the late rains; at the present the original top is nearly all dead, and a new one formed, which bids fair to rival the first, if left to stand long enough. But it is supposed the root, although a pretty good size, has lost much in growth by the decay of the first top, and its maturity protracted, if indeed the crop be not much diminished. My inference is, that *late* culture, even if the weather be seasonable, may be injurious, by destroying the the fibrous side roots, which seem to be indispensable to the plant during its latter stage—and that consequently the earth should be kept in good tilth while it is young, and afterwards left alone.

The best crop of beets I have raised was in 1837, alternated between rows of corn; a full crop of the latter was obtained, (as was believed) and three hundred bushels of beets per acre besides; those in open patch a long side did not do so well; the shade of the corn seemed to be useful during the dry weather. I intend rerpeating this plan next year.

J. JENKSNS.

VEGETATIVE POWER OF SEA SAND.

A few days since a quantity of sea sand was carried out of Morecambe Bay, about a mile from the Furness shore. It had been, less than an hour previously, covered a considerable depth by the tide, and contained several cockles and other shell fish. It was immediately placed in pits or beds, fifteen inches deep, and sown, without manure or admixture of any kind—just in the state it was when taken from the bay—with wheat, barley, peas, mustard, cress, and radish seed. In five days the mustard, cress, and radish seed had sprouted, and begun to vegetate, having thrown out a considerable length of root, while (what is most extraordinary) the shell fish were even then alive! Thus have we wheat, barley, peas, mustard, cress and radishes, all growing, and cockles and other shell fish in a living state, in one and the same bed of sea sand! Should any one be at all incredulous as to the truth of this statement, he can easily try the experiment himself; an ordinary flower pot filled with sea sand, sown with almost any kind of seeds, would at once put the matter to the test. Common hay seed sown in October last in beds of sand similar to the above, and treated exactly in the same way, have now grown to the extraordinary height of 3 feet 6½ inches. Some wheat sown about Chrtstmas last (now in ear) 3 feet 3 inches; barley do. 3 feet 3 inches; peas sown about April last (pods completely formed) 3 feet 3 inches. The farmers all around the Bay of Morecambe, in forming composts for their wheat and barley crops, use of sea sand about 26 carts (small one-horse carts,) lime, about four carts, manure, ten carts, per statute acre. Why use so great a quantity of sea sand if it does not possess very considerable vegetative power?—*Eng. Paper.*

REAPING MACHINE.

To the Editor of the Farmers' Register.

Talbot, Md., Sept. 14, 1839.

I send, herewith, two papers containing articles respecting Hussey's wheat reaper. One of them (the report of the committee which tried it near Philadelphia) is so full and satisfactory that I deem any further description of it, by me, as requested, even if I were competent, altogether unnecessary. From my experience in its use, of three years, I am of opinion they have not said in its favor a single word too much.

SAML. HAMBLETON.

REPORT OF A COMMITEE OF THE PHILADELPHIA AGRICULTURAL SOCIETY, ON HUSSEY'S REAPING MACHINE.

The committee appointed at last meeting, to superintend the operation of Hussey's Reaping Machine, beg leave to report:

That they discharged the duty of their appointment on the day following the same. They met for the purpose on the farm of Mr. John Fox, in Oxford township, where the machine was put in operation in a piece of several acres of heavy wheat, considerably lodged—and contrary to the expectations of most of the committee, it performed remarkably well.

The machine requires two horses to draw it, a boy to drive them, and a man to push off the grain. It is not material whether the speed be a walk or a slow trot, though a walk, where the grain stands tolerable fair, is to be preferred. A trot is sometimes necessary where the grain is much lodged, or a strong wind drives in the direction of the machine. It operates very satisfactorily in grain so much fallen as to be entirely beyond the ability of the cradle; and the grain is generally laid fully as regularly as by the cradle, with the advantage on the part of the machine, that it is laid in heaps ready for binding, thereby saving much labor in thin crops, and rendering a rake unnecessary. So perfect did the machine perform, even in grain considerably lodged, and in which a cradle could scarcely have been used at all, that not a stalk was left standing, while the stubble presented one uniform height of about seven inches throughout the field. The loss, too, by this mode of harvesting, is greatly reduced. The machine operates somewhat on the principle of the common shears, requiring nothing of the momentum of the cradle; and the only jarring attending it is from the weight of the grain falling on a smooth surface. The wheat cut on the present occasion, was dead ripe, having been standing two weeks longer than necessary, and yet scarcely a grain could be found shattered out.

It is estimated by the committee, that the ordinary performance of this machine is from ten to twelve acres per day; although they fully believe, that, on an emergency, it could accomplish twice this amount of work. In confirmation of this, they would state, that it cut, on this occasion, six hundred and thirty square yards in two minutes, doing its work in the most perfect manner. It requires from six to ten persons, according to the state of the crop, to bind up or remove the grain as fast as cut, which it is necessary should be done to prevent it from being crushed by the horses and wheels of the machine, on the succeeding through. The machine is not liable to get easibly out of order; and the cutters, although they are very readily sharpened, seldom require it, as more than one hundred acres of grain, according to the statement of Mr. Hussey, had been cut by those attached to this machine, prior to the present occasion.

Upon the whole, the machine did its work remarkably well, whsre it was possible for any thing except the naked scythe to penetrate—and so far as the commiitee could perceive, to the entire satisfaction of a number of intelligent farmers present on the occasion, most of whom were, at first, not a little skeptical of its utility.

Your committee would say, in conclusion, that they believe the reaping machine of Mr. Hussey, to be an advantageous substitute for the present mode of cutting grain on large farms, or where two or three adjoining farmers of the ordinary amount of land in this vicinity unite in using it—the price of one being one hundred and fifiy dollars. We would therefore recommend it to the attention of this society, and the agricultural community generally,

K. Smith,
John Fox,
Jacob Shallcross,
P. R. Freas.

For the Farmers' Register.

THE MATURING OF CORN HASTENED BY EARLY CEASING TO CULTIVATE THE GROWING CROP.

I avail myself of a rainy hour to return your philosophical correspondent, Senex, my hearty thanks for his very beautiful explanation of the manner of the acting of plaster of paris upon limed land; time *may* prove him right in his speculations, but right or wrong, I thank him. The man who cultivates his racionating faculty has always been more in request than he who cultivates that of discrimination. Without much care for the philosophy of this matter, it is my purpose to push the facts to all useful extent. I think that it was that singular, yet great man, Napoleon, who said that "if he gave ear for one hour to the philosophers of his court, his dynasty would not last three days." Perhaps a *mere practical farmer* has as little to expect from philosophy as Napoleon; in practical life it is a great matter to think correctly; but to apply those thoughts *usefully*, is not a matter of less importance.

I have another curious fact to state in relation to my corn crops. The land was turned with a good plough and two horses, then checked at right angles, 4½ feet square, and planted from the 4th to the 10th of April. It was then cultivated with the common cultivator, and once cleaned with the hoe around the plants. Upon the 16th of June, I withdrew the labor of cultivation to the harvest field, and was unable afterwards to pass my horses through the rows without breaking off the shoots. Upon the 10th of August it was ready to be stripped of tops and fodder. Now my immediate neighbors planted at the same time, and ploughed their corn four times; mine was mature full three weeks before theirs; now here is a fair case for philosophy.

I am now burning shells for the second application to my fallow of 60 bushels per acre, the first having been made three years since. Clover seed is for the greater part a failure, owing I presume to the cloudy wet weather. This will compel me to take successive crops from the same land; an odious practice, except in the mountains and upon their best land.

I have stated the facts having relation to my corn crop, believing that the saving of three weeks in the cultivation is a matter worthy of notice. My obliging friend Senex may be able to account philosophically for the rapid maturation of the crop. If time be money, not less than $100 was saved in the cultivation of the crop, and I entertain the belief that the crop has been made without injury to the land; that is, that a summer fallow would have been as injurious as my crop of corn, or more so. What should be done with weeds from two to four feet high, covering all my wheat stubble? Nature's course is onward; are they the means she uses for that purpose under the influence of lime?

A Fairfax Cultivator.

We presume the weeds which have succeeded the growth of wheat, are annuals, (as carrot weed, crop-grass, &c.,) which will not appear next year, and keep the land foul, but will yield their place to some other crop in *nature's manuring rotation*. Nothing is required but to *let them alone*, and they will serve to top-dress, and enrich the land; and first to protect and next to manure the next year's clover, if clover be already sown, or if not, such other crop, natural or artificial, as may succeed.

Ed. F. R.

ON THE VALUE OF SUN-FOWER SEEDS FOR OIL.

To the Editor of the Farmers' Register.

Athens, August 25th, 1839.

Although a stranger to you, I take the liberty of addressing you, upon the subject of the *sun-flower plant*; knowing that you take a deep interest in any and every thing connected with agriculture, &c. For the last five years my attention (mental I mean,) has been at times occupied on the merits of this plant, as a valuable addition to, if not a supersedent of our oils, now in general and unavoidable use. I have used the term mental, because I have expended much more of thought than manual exercise upon the subject. From the limited trials made, however, both in the culture of the sun-flower, and the home-made ex-

traction of the oil, and the results in its use for domestic purposes, I am compelled to believe, that the oil extracted is equal if not superior to any other now in use; answering the place of olive oil, for the table, and spermeceti, and all other kinds now in general use, for all the requirements of painting, lighting of lamps, &c. &c.

This may appear a very broad assertion to those who have for the first time had the subject brought to their view, and to others who have fallen into the received opinion, that the oils now in use are the best, because they answer the immediate wants and requirements; not reflecting that it takes two or more of these specific kinds and qualities of oil, to supply the necessary wants and uses—when this oil, if properly cultivated and prepared, will answer, if not take the place of all others put together.

A grand desideratum, and which ought not to be lost sight of, is, that for lamps, it burns as long, gives a clear and more brilliant light, exhales no disagreeable or unhealthy odor, no apparent smoke evaporates from the wicks, and consequently leaves none of those dark and unsightly features of soot attendant upon even our finest oils now in use. All of which, without the aid of philosophy, is apparent to even the most careless observer, to be detrimental to the health of families thus using them, and repugnant to the olfactory nerves.

These remarks hastily put to paper, is intended to draw from you any information or experience you may be possessed of in regard to the sunflower plant, for the purposes here mentioned, or as food for stock or poultry; and you will confer a singular favor upon me, by letting me hear from you on the subject so soon as convenient.

With respect,

N. A. Adams.

We have no experimental knowledge on the subject of the foregoing letter; and request that any information possessed by others may be afforded through our pages. In the agricultural and other papers, sundry articles have appeared, within the last twenty years, recommending the oil of the seeds as a substitute for olive oil. But, so far as we know, there has been no statement of practical results, or of cost and profit.—Ed. F. R.

A BIRD STORY.

From the Cultivator.

Milton, Ulster co. N. Y. July, 1839.

Friend Buel.—I would not have ventured to forward the following statement, were it not that the narrator of it, Edward Hallock, of the firm of Wm. Hallock & Brother, of Milton, Ulster, co. is known to thee, and known to be of unquestionable veracity. I have heard him before express his conviction, that if birds were protected and cherished by farmers and others, we should never be subjected to the loss of corn or other crops by grubs; and that other noxious insects would be sensibly diminished. There is a small kind of bird (the males nearly black, the females brown,) that is noted for being around and following cattle in the field, as in the case I am about to detail. Mr. H. says, "on the 26th of the present month, I was ploughing for turnips, myself with one team, and my son with another; and observing that we were followed by a flock of the above little birds, I took it into my head to notice their motions, to ascertain what was the attraction, when I perceived that their object was grubs. We ploughed up plenty of a small white, and a large brown or gray grub, as well as some in a chrysalis state, and angle worms; all of them, *excepting angle worms*, appeared to be acceptable to them; and as the sequel will show, they were capable of devouring large quantities. I should think that one would make way with at least 100 per day. I cautioned my son against making any motion towards noticing them, in any way to intimidate them; as I found they grew more and more bold in their honest avocation, and as the land diminished in width, they would remain in the opposite furrow when not more than three or four feet distant. At length my son spoke cautiously, and said there was one on his plough beam. I then stopped the teams and told the boy to pick up a grub and throw it to the bird that had distinguished itself by its tameness. He did so; and the bird immediately seized it. Encouraged by this, I told him to pick out the next white one and hold it out in his fingers near the ground; crawling down, he did so, and the bird came and picked it out of his fingers! Afterwards he stood up and held out one, and the bird lighted on his hand and picked out the worm. This was repeated until it lighted on my own hand; I raised it up and applied my cheek to its wing without frightening it away. The next day he was not slow in finding us, and practised the same familiarity, in presence of James Sherman, William Hallock, and others of the neighbors; it came into the corn field where the boys were weeding corn, and actually, without any special attraction, perched upon the head of one of the boys; it continued these visits until one of the boys in an adjoining field, could not repress his inclination to seize and hold it. This made him more wary, but he gradually recovered his confidence." I communicate these facts in the hope that they may contribute to produce an examination into the subject, of how far it would tend to the agricultural interests, to fall upon some method to tame and familiarize small birds, instead of frightening, maiming, or destroying them.

E. Hull.

TO CURE WOUNDS ON HORSES AND CATTLE.

From the Genesee Farmer.

Mr. Tucker—I became a subscriber at the commencement of the 3d. volume of the Weekly Farmer, and in the first No. of that volume, I found a recipe to cure wounds on horses and cattle, which alone has been worth more to me than ten years' subscription, and I think it would confer a favor on thy patrons to republish it in the present volume.

Silas Gaylord.

Skaneateles, 7th mo. 26, 1839.

The following is the receipt alluded to, in the above note of Mr Gaylord:

As there are many useful receipts hidden from the public, for the sake of speculation in a small

way, by many who would be thought something of in the world, I am induced to lay before the public a recipe for making KING OF OIL, so called, which perhaps excels any other for cure of wounds on horses or cattle, and which has long been kept by a few only in the dark. Feeling a desire to contribute to the good of the public, but more especially to the farmers of Genesee, I send you the following very valuable recipe for publication:

1 oz. of green copperas, 2 do white vitroil, 2 do common salt, 2 do linseed oil, 8 do West India molasses.

Boil over a slow fire fifteen minutes in a pint of urine; when almost cold, add one ounce of oil of vitrol and four ounces spirits of turpentine.

Apply it to the wound with a quill or feather, which will immediately set the sore to running, and perform a perfect cure. Yours respectfully,

STEPHEN PALMER.

Middlebury, Dec. 10, 1832.

PRICES OF STOCK IN KENTUCKY.

From Capt. Marryatt's Diary.

Of the cattle show of Lexington, (Kentucky,) the fourth day was for the exhibition of jackasses of 2 years and 1 year, and for foals and jennies also; this sight was to me one of peculiar interest. Accustomed as we are in England to value a jackass at thirty shillings, we look down upon them with contempt; but here the case is reversed; you look up at them with surprise and admiration. Several were shown standing fifteen hands high, with head and ears in proportion; the breed has been obtained from the Maltese jackass, crossed by those of Spain and the south of France. Those imported seldom average more than fourteen hands high; but the Kentuckians, by great attention and care, have raised them up to fifteen hands, and sometimes even to sixteen. But the price paid for these splendid animals,for such they really were, will prove how much they are in request. Warrior, a jackass, sold for 5,000 dollars, upwards of £1,000 sterling. Half of another jackass, Benjamin by name, was sold for 2,500 dollars. At the show, I asked a gentleman what he wanted for a very beautiful female ass, only one year old; he said that he could have 1,000 dollars, £250, for her, but that he he had refused that sum. For a two-year old jack, shown during the exhibition, they asked 3,000 dollars, more than £600. I never felt such respect for donkeys before; but the fact is, that mule-breeding is so lucrative, that there is no price which a very large donkey will not command. I afterwards went to a cattle sale a few miles out of the town. Don Juan, a two year old bull, Durham breed, fetched 1,075 dollars; an improved Durham cow, with her calf, 985 dollars. Before I arrived, a bull and cow fetched about 1,300 dollars, each of them about £280. The cause of this is, that the demand for this stock, now that the western states are filling up, becomes so great, that they cannot be produced fast enough. Mr. Clay, who resides near Lexington, is one of the best breeders in the state, which is much indebted to him for the fine stock which he has imported, and I quote the prices: Yearling bull, 1,000 dollars; do heifer, 1500. Cows of full Durham blood, but bred in Kentucky, 1,245 dollars; do. 1235 dollars. Imported cow and calf, 2,100 dollars. It must be considered that although a good Durham cow will not cost more than twenty guineas perhaps in England, the expenses of transport are very great, and they will generally stand in, to the importers, about 600 dollars, before they arrive at the state of Kentucky.

EXTRACT FROM AN OLD AUTHOR, CONCERNING MILDEW IN WHEAT.

To the Editor of the Farmers' Register.

Looking over old Fuller's 'English Worthies' last evening, I was so amused at his 'Farewell to Middlesex,' that I have transcribed it, thinking it may serve to fill up, in an interesting way, some spare corner in the next number of your valuable journal. Yours, S.

"This county," says he, at page 47, vol. 2, "is much infested with *mildew*. That it is, I know to my cost; but could not purchase the knowledge what it is, much less how it might be prevented, at the same price, though having diligently enquired into the name and nature thereof.

"Some will have it called *mildew, quasi maldew* or ill-dew; others *meldew* or honeydew, as being very sweet, (oh! how lushious and noxious is flattery!), with the astringency thereof causing an atrophy or consumption in the grain. His etymology was peculiar to himself who would have termed *mildew*, because it grindeth the grain aforehand, making it to dwindle away almost to nothing. It falleth (be it mist or dew) when corn is almost ripe for the sickle, and antidateth the harvest (not before it is welcome, but) before it is wished for by the husbandman, grain being rather withered than ripened thereby. If, after the fall, a good rain, or strong wind cometh, it washeth and wipeth it off, so that no mischief is done: otherwise, the hot sun arising, sealeth (to use the husbandman's phrase) the mildew upon the straw, and so intercepteth the nourishment betwixt the root and the ear, especially if it falleth not on the *hoase* (which is but another case, and hath another tunicle under it) but on the stripped straw near to the top of the stalk.

"Grain growing under hedges (where the wind hath least power) is most subject thereunto, though wheat of all grain is most; bearded wheat of wheat is least liable unto it; not that *the hawnes* thereof *are spears* to fright the mildew from it; but *advantageous gutters*, to slide it away the sooner which striketh on rotted or pollard wheat.

"*Inland counties*, Northamptonshire, Bedfordshire, &c. complain the least; *maritime* the most, of mildew; which insinuateth *the vapors of the sea* to be casuall thereof; some hold that, seeing that, it falls from the skies, earth hath no guard for heaven's blowe, *save praier*, which in this very case is prescribed by Solomon.* But others conceive, that humane may be subordinate to spiritual means; to prevent not the falling but the hurting of this dew in such a degree, and hopefully expect the remedy from the ingenuity of the next generation.

"I am the rather confirmed in my hopes, because

* 1st. Kings, viii, 37.

a help hath been found out against *the smooting* of wheat, at least wise in some good proportion; I say the smooting of wheat, which makes it a negro, as mildew makes it a dwarfe; viz. by mingling the seed with lime as your husbandmen will inform you.

"And for my vale to this county, I heartily desire that either God would of his goodness, spare the fruits of the earth from so hurtful a casualty, or put it into the minds of men (if it may stand with his will) to find out some defensitive in some part, to abate the malignity thereof."

LETTERS FROM AN AGRICULTURAL APPRENTICE TO HIS FATHER.

(Continued from page 542.)

From the (Edinburgh) Farmers Magazine.

Class III.

July 28.—Since my last, a material change of weather has taken place, which occasioned much positive loss in the first instance, and a great deal of additional labor afterwards. It is under such circumstances that the judgment and activity of the farmer comes to be most completely ascertained; because the derangement of his usual plans throws every branch of work out of shape, and causes a resort to measures of expediency or of a temporary nature, In such a situation Mr. Jamieson shines conspicuously. His mind seems stored with resources for every emergency, and the difficulty of the case appears to give increased strength to his natural powers. He shapes his conduct to the circumstances under which he is placed, constantly preserving the greatest order and regularity.

Last week a violent and continued rain for twenty-four hours occurred, which, to a certain extent, floated the fallow field, wetted the hay ricks, stopped the thinning and cleaning of turnips, and lodged at least one half of the corn crops on the farm. With such a number of people, many farmers would have been thrown into utter confusion, or at least one half of those below them would have remained idle, while others would not have been much more profitably employed. Not so with Mr. Jamieson; for the rainy day was as throng a one as ever I saw since I came here. The several inventories were examined, and deficiencies noted down with the greatest accuracy. Two pair of fanners were set to work in dressing of corn. The lofts were sweeped, dusted and cleaned; in short every one was sedulously employed. When the rain ceased, my whole *corps* were instantly despatched to the fallow and turnip fields, and express orders were given me not to suffer a drop of water to stand on any of them; of course I had not a dry foot while in the field, but fortunately was not the worse of this treatment, having taken care to shift regularly after working hours. When thus employed, Elliot and his ploughmen were busy in removing dung from the farm-yards, and middening it in a regular manner on an adjoining field of grass-land, where it is to be used next winter; and as two hundred bolls of wheat had been lately sold, Mr. Jamieson took this opportunity of delivering it to the merchant. Even Howard and his herds were not idle; for, as several markets were held at the time, he and they were seldom at home at this troublesome period. The thrashing machine was likewise so busily employed after the weather settled, that our stack-yard has become nearly empty.

Every thing seems now to be restored to order except the hay, which will give us a little trouble before it can be safely stacked. Mr. Jamieson says it has received damage which cannot be cured, and that I will soon see the extent of injury done to hay, by a fall of rain, while in the cock. He adds, that it is much less hurt by wetness during the early stages of the winning process than when in the cock; because the natural fermentation which necessarily takes place is then reinforced by artificial auxiliaries, consequently that a degree of putridity ensues, inevitably injurious to the article. Fairbairn has returned to the turnip field; and the young plants being all thinned and set out, he is going over them a second time, correcting former errors, and destroying every weed that has recently vegetated.

August 4th.—The hay is now safely stacked, though a good deal of work was required before we got it into such a condition as to satisfy Mr. Jamieson. Three days ago, when fine sunny weather and gentle wind prevailed, our united strength was employed to take down the cocks and expose the wet parts to their beneficial influence; after which the whole was re-cocked, great care being taken to mix the external and internal parts together, so as the quality might be equal, and any moisture remaining in the damaged parts absorbed by what was in good condition. It stood for the night in these new made cocks, but next day promising good weather, the carts were set to work about nine o'clock, and in that and the following day the whole was got into the stack-yard. It is put up in two stacks, each containing about five thousand Scotch stones, or fifty-five English loads. The charge of superintending the loading of the carts was committed to me, and I had full proofs of the truth of Mr. Jamieson's previous opinion respecting the damage; those parts of the cock that were wetted, though made perfectly dry, breaking with the slightest touch, and appearing altogether devoid of substance. Mr. Jamieson says the damage will not be so apparent after the stack-sweat has ensued, though perhaps he means that the partial damage, being thus transferred to the whole stack, will not be so discernible as when confined to a certain portion of it. The stacks are to be immediately combed down, completely covered with straw and hard roped, so as they may be secured from the storms of winter. I observed that where clover was most plentiful, the hay had suffered most; and, *vice versa*, that the cocks containing the greatest quantity of rye-grass were least damaged. Had the cock been of clean clover, I am almost sure that it would have been fit only for the dunghill.

August 10th.—The fallow is now dunging, and four heads of carts, or sixteen altogether, are employed at that business. Each head requires two men to fill, and one to pull out the dung from the cart, while the carter drives the horses regularly forward; and one man and three women spread the heaps laid down by each head of carts, so that thirty-two men and twelve women are thus employed besides the overseers. My post is at the dunghill. Elliot looks after the carts in the field, and sees that the dung is properly drawn out, while

Fairbairn manages the spreaders. We just take out sixty loads a day per head, or two hundred and forty loads altogether. Fifteen of those loads, or thereby, are applied to an acre, Scotch measure; and as each load, from trial, is found to contain a trifle more than one yard and a half of cubic measure, you may have a tolerable notion respecting the extent of the application. In this way we dung about sixteen acres per day, so that in little more than six days the whole hundred acres of fallow will be gone over. Mr. Jamieson is very exact about the spreading, asserting that the benefit of the application depends in a great measure upon the accuracy with which this process is executed; or, more plainly speaking, that fifteen loads, well spread, are of as much use as twenty loads imperfectly separated and divided.

The turnip fields are now completely finished off, and present a notable prospect to the amateurs of good husbandry, having very few blanks, and containing scarcely a single weed. The ruta-baga seemed shy of growing for a long time; and, though now more forward, still presents more naked soil than the yellow and white turnip. The horse, or yam potatoes, show a strong foliage, and perhaps will ultimately be found to return as much root as the ruta-baga. All our corn fields are looking well, and some of them are holding out signs for the sickle, especially the early oats, and first sown barley. Mr. Jamieson has intimated that I am so assist in the field; and given me warning that to oversee there, is a post of no little trouble. He has gone the length of declaring, that the corn farmer must be a slave during the harvest quarter, if he wishes his affairs rightly managed; so I easily understand, if the master is a slave, that his deputies cannot be characterized as filling a much higher station. I shall, however, endeavor to do my duty, trusting that the after advantage will compensate the expense at which it must be gained. Every principle connected with honor and interest call for exertion on my side,—especially as Mr. Jamieson has never ceased to treat me with urbanity, and more like a son, than one sent to learn husbandry under his inspection and direction.

August 20th.—Harvest has partially commenced, though, not having as yet drawn out our whole strength, Fairbairn has only been employed in the management. Next week that important branch of rural economy will be undertaken in earnest, when Howard and I are to be called into action. Elliot is reserved for his horsemen, who, I understand, are rarely taken to the field unless there is a deficiency of hands. At this time he is throng ploughing down the dung put on the fallow field, which works in a capital style; and on this furrow it is meant to sow the wheat seed about the end of September, providing a fresh growth of weeds does not appear before that period. The stack-yard was lately emptied and cleared for the new crop. My squad are making straw ropes for tying down the thatch used in covering the stacks, and every thing is arranging as fast as possible, so as interruptions may be avoided in the great work before us.

September 2.—The past week has been a busy one; and I seize upon a leisure hour, allowed by a heavy shower falling, to acquaint you of our proceedings. On Monday morning, our forces were mustered for harvest work, and were divided into twelve bands of twelve shearers, and two bandsters each, four of which were committed to the charge of Fairbairn, the like number to me, and the remainder to Howard, our head shepherd. The ranking or sorting of the people was done with expedition by Mr. Jamieson, who seems quite up to a matter of that nature; and though half an hour or thereby might be lost before the ranking was completed, yet all that hurry and confusion which, without it, would inevitably have ensued, were altogether kept clear of, and the whole regiment entered to work at once upon a horn being sounded by Fairbairn, who is first in command below Mr. Jamieson. The arrangement was made in this manner.—Mr. Jamieson having ascertained his numbers, selected twelve of those he considered to be the best shearers, and provided them with two able bandsters for tying and stooking the corn; ordered Fairbairn off with these, and to place them on the left or open side of the field, four shearers upon each ridge, with their bandsters behind them. The second, third and fourth bands followed in their course, a ticket being given to each bandster mentioning the band to which he belonged. When the fifth band was formed, I marched at their head, and placed them on their respective ridges, and so on, as the sixth, seventh and eighth band arrived. Howard came with the ninth, and arranged them in like way, and Mr. Jamieson followed with the rear guard. After riding across the field, and being satisfied that all were rightly arranged, he halted in the centre of Fairbairn's hands, and calling *attention*, he stated, in a few words, that these people were committed to his management, and that full power was delegated to him to do every thing which, as a master, he could do himself; that it was his desire to have the corn clean and low cut; and that, while sufficient time was allowed to execute the work, idleness was on no account to be permitted. He then came to my station, and repeated these orders, and concluded with the same in the centre of Howard's division. After this, upon a sign being given, Fairbairn sounded his horn, and immediately the whole body fell to work. The total number were 144 shearers, and 21 bandsters. Three fourths of the former are women, who, in fact, are our neatest cutters. The corn of each band is brought into the middle ridge, and stooked there; a measure which Mr. Jamieson says forwards the loading of the carts considerably. Indeed, independent of this consideration, the less compass that corn can, in the first instance, be put into, so much the more will the stubble be kept clean. Every bandster is directed to draw the bottoms of the sheaves, and to gather up any heads which drop out when he is tying them; so that the quantity left is very trifling.

We had a good deal of drilling the first day, and not a few were dismissed the service as unqualified. These were constantly replaced from a supplementary corps which remained at home, and, before night, our discipline was tolerable perfect. Mr. Jamieson, who commanded in chief, when he noticed any one not working to his mind, always addressed such in a calm but steady manner; explained how he wished his work performed; and requested, if they were incapable of doing what he required, that they would give up without further trouble. About a dozen left us in the course of the first day, who were always paid for the time they had wrought, but no more. The hours here are from sun to sun, with an hour for

breakfast, and the like time for dinner. Twenty minutes rest are also allowed both in forenoon and afternoon. The victuals are brought to the field in three carts, one for each division; and the bandsters of the different bands act as distributors, after the portions are measured out or set apart for each band by the person who drives the cart. The breakfast consists of oat-meal pottage and milk; at dinner, bread and beer are given; and for supper, the like allowance as at breakfast. Fairbairn thinks that it has taken a day of six shearers to cut an acre of wheat; and if so, twenty-five acres have been cut each day. I suppose he is not far from the mark; for we have worked four days and a half, and done little more than cut down the fallow break of one hundred acres. The field presents a fine sight, as it is wholly in stooks of twelve standing sheaves, with two for hoodings or covering the top. A man goes regularly through the field to set up such sheaves as may have fallen down; but should the weather prove dry, it will be carted to the stack-yard in a day or two. The oats and barley cut last week, under Fairbairn's inspection, will also then be ready. The barley lay untied for three days. which was of great benefit in the winning of it. When tried up, it seemed perfectly dry, but Mr. Jamieson says he is always apprehensive of barley heating in the stack, as the softness of the straw allows a degree of compression apt to be followed by a heat dangerous to the grain. I understand it is customary with him to examine every field before the carts are sent to bring any home; and that he is particularly careful to carry none till completely winned. Indeed, when stacks so large as those I saw last year are made, the greatest attention must be necessary, otherwise heating, particularly of barley and beans, could not be avoided. This attention is too often disregarded, many people thinking they ought always to carry when their neighbours are so employed, without reflecting that the winning process is regulated, not only by the ripeness and cleanness of the crop when cut down, but also by situation and size of sheaves. A small sheaf wins in half the time that is called for by a large one, and dries much faster after being completely wetted. All these circumstances should be considered by the farmer before he carries; and on no account whatever should a previous personal examination be omitted. To spoil corn in the yard is a most disgraceful affair to the farmer; though, disgraceful as it is, perhaps it happens oftener than is known. Mr. Jamieson, however, assures me, that it is now much less frequent in the country than formerly, when the crops were fouler, in consequence of the imperfect rotations then practised; also, that the size of sheaves is of late greatly diminished, which permits the winning process to go more speedily and equally forward.

Elliot and his ploughs are seed-furrowing the fallow field, and will be well through with it by the time that the loading of corn commences. The ridge is neatly gathered up, great care being used not to raise it too high in the middle. The horses are supported on green tares, which are in full pod, and appear to be nourishing food. Mr. Jamieson says, no kind of food is better in dry weather, especially if free from rottenness at the root. They are all tied up in bunches of the like size as those of clover; only, I observe, that each horse gets three per day, instead of two of clover; owing, I presume, to the latter being generally more stuffing in the stomach, or, in other words, not so watery and digestible.

September 10.—Our field of shearers was this week augmented by four fresh bands, or 48 additional shearers, who were put under the direction of one of my veterans, often employed in former times when extra hands were brought to the field; so we now cut down a great breadth daily, though the like care and attention are bestowed as at the outset. To save time and avoid confusion, each grieve or steward cuts out and enters the four bands or twelve ridges entrusted to him; and I am now so well acquainted with my troops, that I can place all of them in their proper station, without the smallest difficulty. As we pay weekly such of our hands as leave us on Saturday, a slight drilling becomes necessary on the Monday morning. We go on very smoothly, and keep regular hours. Elliot rings the bell half an hour before sun-rise to prepare; and again, at the first peep of the luminary, when all must march without further ceremony. We have had a few wet, or rather dewy mornings; but, as it was dry above head, Mr. Jamieson, at those times, ordered us to proceed with the work, and to leave the sheaves unbound, or in the state technically called *broad-band*. A detachment was always selected in the course of the day, or when the corn was sufficiently dry, for tying up this broad-band corn; and Howard generally attended those so employed, Fairbairn and I taking charge conjunctly in his absence. Mr. Jamieson has been less with us this week than last one, and more with Elliot, who was busily engaged in driving home corn. Three heads of carts, four in each, have driven for several days, and a considerable number of tall, well-built stacks have been put up, while a set of hands has been employed since the first day in covering them, which operation is here executed very neatly in the dam-board or cross-roping way. About five acres of wheat were thrashed last week, so as good fresh straw might be got for covering;—our summer thrashed straw being two much broken by the machine for resisting rain. This new straw was carefully drawn under Elliot's inspection, and makes excellent thatch. The wheat thrashed has been laid thin on the granary floor, and orders given to turn it daily, till it comes into a keepable state. Being constantly in the field, I have had slight opportunity of personally witnessing the building of the stacks, or the management exercised; but I learn, that a man stands on the stack, and forks the sheaves to the builder, till the stack gets tolerably high, when a kind of opening is left for him to stand, and two stack headers, as they are called, become necessary. The stacks, to be sure, are of great height, and require extra help to complete them; otherwise, I am confident Mr. Jamieson, who is perfectly up to every thing of that nature, would not give such assistance.

September 19.—A good deal of rain has fallen this week, which retarded cutting, and stopped carrying altogether. The first object was to keep all the cut corn a-foot, and to complete the covering of what was carried. Respecting these matters, Mr. Jamieson is particularly careful. When the rains ceased, we cut oats of the late varieties, which were all gaited; in other words, the sheaves were set up single, with bands loose around them, and pulled near to the top, attention being paid to

draw loose heads from the bottom, so as sprouting might be prevented. The same number of hands have been employed as last week; and, should we be favored with good weather, the cutting process will likely be finished in eight or ten days. Elliot has completed seed-furrowing the fallow break, and is now entered upon the wheat stubbles, though, as the weather seems now settled, he will return to the work of carrying with all despatch. Twenty stacks of wheat, oats and barley, are put up, all of equal size, and better built than any I have hitherto observed.

September 23.—Shearing is now over here, though, as part of the beans are still to tie, and a good deal of barley and oats to be carried, we will be very busy for a week or two. All the wheat is stacked; what was sown in spring after turnips, is inferior in bulk to the autumn and winter fields, and I also thought it lighter upon the hand. The grain however, is good, being well harvested, and will prove of greater value than the barley sown upon the same field; which reminded me of the prediction offered by Elliot at seed-time, as mentioned in a former letter. The barley after beans is excellent, and, according to my views, may be 20 *per cent.* in the extent of measure, above that on the turnip field, though I must acknowledge that the latter is of superior quality, and worth more to the manufacturer.

October 12.—Harvest is now finished with us, the whole crop being safely deposited in the yard. I mentioned, in a former letter, that nine hundred acres of the different kinds of grain were sown upon this farm, the produce whereof, except what was thrashed from the field, is secured or put up in ninety-six large stacks, all of them nearly of equal size, and affording a notable sight to the beholder, if he is an amateur of rural science. The whole are completely covered for the winter, a measure which engages Mr. Jamieson's notice in a particular manner; he alleging, that a slovenly managed stack-yard furnishes sure proof, that every other branch of farm management is carelessly conducted. The first built stacks have all been tied down a second time, and I understand that a repetition of this operation is continued till the stacks are fully compressed, when it becomes unnecessary, unless a breach is made by a storm of wind, which is immediately repaired. The business of a farmer has been often supposed to be one within the reach of every blockhead; but I am more and more convinced, that, to carry it on properly, a wise head is not only required, but also a steady hand in the administration of the several duties which appertain to the occupation.

The fallow field was last week sown which wheat, at the rate of ten pecks per Scotch acre; and the seed was carefully pickled or moistened with urine, exactly in the like way as done with what was sown in the spring. There was not a blacked or smutted head of wheat to be seen of last crop, which almost satisfied me that pickling is a radical cure or preventive for that abominable disorder. I remember one day before harvest,, when some gentlemen from a distant part of the country were on a visit to Mr. Jamieson, that, one of them having expatiated, at considerable length, concerning their district being exposed to smut from a particularity of soil, Mr. Jamieson took him up, and offered to wager five guineas, that a single smutted head would not be got amongst his fields. Done, replies the gentleman; for I never saw a wheat field in my life but what was less or more smutted. The gentleman then proceeded to examine the field with the greatest attention; but, after an examination of several hours, was obliged to declare that the soil of Mr. Jamieson's farm certainly differed from that of every one he had hitherto known, otherwise it could not have escaped that baneful malady. No, says Mr. Jamieson; my soil is the same with other people's; but perhaps greater exertion is bestowed to avoid an evil, which assuredly is too prevalent, and which proceeds entirely from negligence and inattention.

The winter stock of cattle and sheep is now brought home, Howard having been at several markets to procure them. One hundred head of cattle are provided for the straw yards, and these are presently ranging the stubbles. Howard tells me, they will not be put upon straw so long as the weather continues dry, and that a few turnips will be given them after Candlemas, to bring their blood into good order before the grass season arrives. Twenty score of ewes are provided; and this branch of stock is considered by Mr. Jamieson as highly profitable, though he acknowledges that, without cattle, he could not convert his straw into dung. About forty fine oxen, purchased at the summer markets, and grazed since their arrival on the pasture fields, are intended to be fed at the stake on turnips; but, as these matters are altogether in Howard's department, I can only speak of them in a transient manner.

Last evening Mr. Jamieson gave an entertainment to his servants of every description, on account of the finishing of harvest. He was pleased to take the head servants to the parlor, with his own family, which certainly was paying us due attention; but, after supper was over, he desired us to follow him to the large mill barn, where the other servants were feasted; and, taking a glass in his hand, when we arrived there, desiring us to do the same, he addressed the numerous assembled body in the following terms.

"My lads, I drink health and happiness to each of you, and to your several wives and families.—May Providence bless you all—may you be spared for many harvests, and enabled to perform your respective duties, with the fidelity, as uniformly displayed in the one, the conclusion of which we are now solemnizing."

In this kind and benevolent manner does this good man constantly behave to those below him, thereby attaching them to his interest more effectually than can be accomplished by the hard or austere master. Such may procure obedience when present; but the moment that his back is turned, the ties of duty are instantly relaxed. The study of human nature is a science followed by few people; but I am convinced that no branch of knowledge ought to be cultivated with more seduliry. Without some degree of perfection in this science, none can act aright in their passage through life,—none can sufficiently discharge the duties which appertain to their respective stations,—and none can enjoy true felicity, or possess real contentment.

Class IV.

Nov. 4.—Since the finishing of harvest work, my squad has been chiefly employed in cleaning out the stack-yard, casting *gaw* furrows through the

wheat lands, and turning dunghills, which are to be applied upon the clover stubbles. Some of my hands have also, on different days, been with Fairbairn at the thrashing machine; as, besides seed wheat and horse corn, about four hundred bolls of barley are already thrashed. In a conversation lately with Mr. Jamieson, I was made to understand that the early part of the season was the fittest time for thrashing barley, merchants being then better disposed to make purchases than at an after period. Most of the straw has been stacked in the court or farm-yard, to be taken down occasionally for littering the wintering cattle which were last week brought from the stubbles. They are divided into three lots, each of which occupies a separate yard, and have plenty of fresh oat-straw furnished to them four times a day, it not being thought advantageous to keep a greater number together. Howard, who superintends the cattle and sheep department, tells me, that much of the after success depends upon arranging the different divisions, according to size and temper, and, in particular, upon keeping those that are polled, or without horns, by themselves. A pump-well is in each yard, which is a matter of importance. The forty oxen purchased at the summer markets are now put to the stake, and fed on turnips, three men being appointed to clean and feed them, and to take care of the hundred cattle on straw. Tups were put to the ewes about fourteen days ago, in the proportion of one tup to fifty ewes, and they are now ranging the clover stubbles. They have been rubbed with tobacco liquor and turpentine, so as itch or scab may be prevented.

The wheat seed is nearly over, all being deposited in the ground excepting on that part of the field under potatoes last crop, to which Mr. Jamieson wishes to give an additional furrow. What was sown after beans required a great deal of harrowing before the surface was reduced sufficiently; but as fine weather prevailed at the time, the work was accomplished in a satisfactory manner. Fifty acres of the clover stubble have likewise been seeded with wheat, which will give three hundred acres under that grain next year, viz. one hundred acres after naked fallow, the like quantity after beans, fifty acres after clover, fifteen after potatoes, and thirty-five acres intended to be sown in spring after turnips. The clover stubble got a double time of the harrows, before the seed was distributed; and, being well laid over in the ploughing, little of the turf was drawn up in the harrowing process. Every field is neatly water-furrowed, and the cross and headland furrows completely digged and cleared out, so as water may run off without the smallest interruption. Hitherto the ploughs have gone two journeys per day; but next week Mr. Jamieson proposes to limit their work to one journey of five hours and a half, and to employ the ploughmen at any odd jobs about the homestead, after their horses are foddered and cleaned.

Nov. 30.—The small patch of wheat after potatoes, was finished a few days after the date of my last letter; since which, Elliot has been busy with the ground intended for beans, one half of which he has ploughed across, and the other he is now ploughing in length, intending to give this portion a cross-furrow in spring, preparatory to the drilling process. You will remember that I mentioned this plan in one of my first letters; and Mr. Jamieson is resolved to give it a fair trial. There can be no doubt of success, provided the weather is dry at that season; but that provision must be risked, and indeed such risks are unavoidable in every branch of farm-management, where good weather is a necessary appendage to their successful completion. At all events, as the land is well gathered up, it must be much sooner dry in the beginning of spring, than the field ploughed across the ridges, though the strictest attention was paid to water-furrow the latter in the completest manner.

A very considerable quantity of grain has been delivered to the merchant this month, three fourths of our barley being thrashed, besides several hundred bolls of wheat and oats. Fairbairn's people are seldom out of the mill, being either thrashing or dighting; and as there is plenty of barn-room, two pair of fanners are constantly employed when the latter operation is going forward. Hitherto, the working horses have been fed upon hay since the green food was finished; but now they are to be put upon bean straw, which is to be regularly tied up in bunches, under my direction, as it comes from the thrashing mill. Two feeds of oats, of six pounds avoirdupois each, are given to every horse per day; and, though lately hard wrought, they are in tolerably good condition. Mr. Jamieson, about a fortnight ago, purchased four fresh horses, five or six years of age, to replace the like number that were getting superannuated, and informs me that he is always well satisfied when a greater supply is not annually required. He gave two hundred guineas for these four horses, which will show you the extent of expense required to support the tear and wear of his working stock. Few casualties or diseases have occurred since I came here, with this branch of the stock, and only one concluded fatally. This was with a horse affected with dry gripes, or belly-ache, which ended in mortification, and killed him in twenty-four hours after he was seized.

The turnip cattle are doing well, and regularly looked after. As the field, whence the turnips are brought, is at a considerable distance from the farm-yard, two carts are constantly employed in driving them home, with an additional number on Saturday, so as Sunday's maintenance may be provided; but Mr. Jamieson means immediately to store a considerable quantity in the stack-yard, as a resource, should snow fall, or frosty weather set in; a measure, undoubtedly, of material importance. I consider the expense of carriage home as not short of three pounds sterling per acre, which in one respect might be saved, were the crop consumed by sheep on the spot; but then, how and in what manner would the immense quantity of straw on the premises be converted into dung? Holding this important circumstance in view, the system adopted must be considered as highly beneficial, even though attended with a heavy expense, therefore deserving of imitation. No turnips have as yet been given to the breeding ewes; and I understand they will not receive any till the middle of January, unless a snow storm happens before that time.

Dec. 18.—We were all much alarmed lately by a severe indisposition which attacked our worthy master; but providentially these fears are now removed, by his complete recovery. On the second day of his illness, when a violent fever was dreaded by the medical people, he sent for his five head

servants, and calmly stated, that, being unable to give directions, he requested each of us to manage the work of his own department in the best way possible, till the issue of his indisposition was determined; and added, "You all know my general intentions so well, and have acted so faithfully in my service, that I have the firmest trust matters will go on much in the same way as if I were at your head." After signing a draft on his banker in favor of the clerk for one hundred pounds, out of which the working people might be paid during his illness, he shook each of us by the hand when we retired from the room, offering our earnest wishes for his recovery.

That same evening we had a meeting in the clerk's office, when with a view to promote the interest of our employer, it was agreed upon, that Elliot should assume the general control, and that each of us should submit implicitly, *ad interim*, to his directions, in order that regularity might be preserved. Orders were therefore given out in the same way as if they had proceeded from Mr. Jamieson himself; and so powerful is the force of former habits, that prompt obedience was given by every one to the orders issued, though it was well known Mr. Jamieson had no hand in them. I will not say that the like obedience could have been long maintained, as probably the steady discipline exercised by Mr. Jamieson, like the centrifugal force of a machine, carried the system on, even when the impelling power was withdrawn. Be this as it may, I rejoice that Mr. Jamieson's recovery prevented the strength of our government from being ascertained. In four days, his disorder, which originated in a severe cold, took a favorable turn, and, on the eighth day of his confinement, we were admitted to his room. He is gradually getting better, though, hitherto, he has not been out;—a caution justified by the season of the year.

I have often reflected upon the critical situation in which the affairs of a farmer are placed, when he is confined to a sick-room, and cannot help thinking, that his case is then more to be lamented than that of other classes, when deprived of health and strength, and prevented from attending on business. The chance of loss from dishonesty and unfaithfulness in those employed, may be viewed as the same in every instance; but, laying these things aside, the nature of the farmer's affairs or business is such, that the best arranged system cannot be followed out, or carried into execution with the like precision or uniformity, as is perfectly practicable with a business carried on within doors. Hence in the first case, when the main-spring or impelling power is partially impeded, the motion of the small wheels is likewise irregular and disordered. To speak in plainer language, the propriety and expediency of every field operation depending upon the weather, mischief, instead of benefit, is often committed by the most active exertions, when not tempered by judgment. Not many led farms, as they are called, are therefore managed judiciously, except when committed to the charge of a servant qualified for being entrusted with discretionary management; and where such guide, the master's presence is of less importance. The same remark applies to farms possessed by widows, especially if they interfere in the executive department. Unless a very steady and clear-headed overseer is procured, it would, in nine cases out of ten, be more for the interest of those concerned, even for the landlord, that such farms were instantly subset, then to remain under the feeble management and imperfect husbandry generally exercised.

Dec. 30.—Mr. Jamieson is now quite well, and has resumed his superintendence as formerly. I can assure you, that the resumption affords every one of us much happiness, on more accounts than one, because, during his confinement, we felt an anxiety not to be coveted. We have got thanks from him for our attentive management, as he was pleased to characterize it; and what some people would consider as of more value, a guinea a piece to buy a new hat, as a compensation for extra trouble. I have intimated to him your desire that I should return home at Candlemass, which he kindly acquiesced in; and am vain enough to think myself now qualified, either to give you material help, or to take charge of a farm, should such be procured on my own account.

The land intended for turnips and beans, next season, is now all ploughed over, and Elliot is proceeding with what is meant for summer fallow; though, in my sight, this field does not stand greatly in need of that operation. It is better, however, to *keep* clean than make clean; therefore, as the field has run its course, a summer dressing must be highly beneficial. Mr. Jamieson has repeatedly said to me, that in no way whatever can the same benefit be received from manure, as when applied to a summer fallow, because the pores of the earth are then open, and duly prepared for receiving a supply of nourishment; whereas, when laid upon grass or unploughed land, and turned in with a whole furrow, the ground is only partially impregnated by the manure. I think this accords with reason,—therefore felt surprise when I learned, that there is a set of agriculturists who decry summer fallow, as an unnecessary and useless practice.

We have got abour two hundred cart loads of turnips home to the stack-yard, where they are built in a long stack, with an arched roof, and well covered in, for resisting the weather. The tops and tails were all cut away, and given to the wintering stock. I suppose the turnips thus brought home may answer for twenty days food; therefore, as snow storms are rarely of longer duration, little inconvenience can be sustained from hard weather. Besides, we have a large houseful of yam potatoes, which will make up for any after deficiency.

I mentioned before, that the bean straw is tied in bunches by a part of my squad, and lately had the curiosity to ascertain what quantity of ground was required to furnish straw, for one day, to the working stock, and the quantity of grain yielded from the straw of one day's consumption. I first inquired at Fairbairn, about the number of acres on which the contents of each stack were raised; and finding, on an average, that the bean stacks contained the produce of seven acres each, I kept an exact account of the bunches of straw; and the result was, that six hundred bunches, of one stone and a half, of 22 lib. avoirdupois each, were in the stack. Now, as I learned afterwards that the quantity of grain amounted to 63 bolls, of 4 bushels each, which was at the rate of nine bolls, or thirty six bushels per acre, and as the working stock (36 plough horses, and 4 old ones for driving turnips,) require 60 bunches per day, it appears, that a stack

will suffice exactly for ten days consumption; that straw is used each day, which carried six bolls, one firlot, and three forpets of grain; that each bunch of straw yielded something less than one peck and three forpets; and that the extent of ground which produced the straw for one day's consumption, was seventy hundredth parts of an acre, Scotch measure. I have detailed these particulars, being sensible, that every thing favoring method and accuracy, is highly acceptable to you.

The machine thrashes the beans most completely;—indeed, not one pod is left unstripped of its contents: but in some cases it *hashes*, of course wastes, the straw considerably. Mr. Jamieson says that the saving from machines is much greater with wheat and beans, than with oats and barley,—the first mentioned grains being rarely clean thrashed before machines were introduced. The reason he assigns is, that unless sharp skutchers are constantly used, oats are seldom completely thrashed; and that barley, by reason of the long awn which adheres to it, is with difficulty prevented from going off amongst the straw. Indeed, he one day assured me, that a machine, to be perfect, should be provided with two sets of skutchers; one for oats,—and the other, more round, for wheat, barley, and beans. He added, that sharp skutchers do not suit wheat, as they cut the stalk over by the neck, and so occasion much of the grain to remain amongst the offal.

Jan. 16.—After two or three days frost, a heavy fall of snow came on last week, which, for a time, has effectually stopped field operations. All Elliot's people, and some of mine, are therefore employed in removing dung from the straw-yard, which is middened on the field intended for turnips, and, with every coat of dung, or, more properly speaking, unrotted straw, another of snow fallows, which in my humble opinion, will have a powerful effect in hastening putrefaction; because, independent of all chemical reasoning on the subject, the snow will only melt in a gradual manner, thereby moistening the dunghill much more effectually than if the greatest quantity of water had been thrown upon it. Mr. Jamieson declares, that he never saw a bad hill of dung, when mixed up with a full quantity of snow; and that this incorporation ought not to be neglected, when the means are gratuitously provided by the elements. I omitted to mention, that the turnip dung is also laid in layers upon the dunghills, and that the whole is carefully shaken and spread thereupon. We have already got out a large quantity, and, should the storm continue, the yards will be cleared. However, as there is an immense pile of straw in the centre yard, from which the places bared of dung are constantly covered, there will, in a little time, be as much accumulated as ever. About one third of the stack-yard is emptied; and, should the storm continue after the farm-yards are cleared, Mr. Jamieson says he means to thrash incessantly till good weather returns.

My squad have partly been employed, for two months past, in cutting hedges, and some of them are remarkably dexterous at that operation. Mr. Jamieson has all his hedges broad at bottom, and narrow at top; and in this way a fence is obtained, infinitely superior to the best stone walls. A very few years care, at the beginning, puts them into a situation for this mode of training; and, if that care is continued till they arrive at maturity, the after expense is perfectly trifling. Many farmers, good in other respects, are careless and indifferent about their fences, and neglect to protect and train up what was originally planted at a considerable charge. Without entering upon the general question, viz. the necessity of fences in every case, all I would say, is, that where they have been reared, a suitable attention ought to be bestowed upon them afterwards. Where a hedge is planted, it must be taaken for granted that it was deemed necessary; therefore, neglecting it afterwards must be considered as unpardonable conduct.

The ewes have got turnips since the storm commenced, a part of the field being railed off; to which they are taken through the day, but at night they are removed to an adjoining park, purposely hained and kept rough for such an emergency. Here, by scraping, they contrive to get a tasting of food; and as they have a bellyful of turnips every twenty-four hours, their situation is tolerably good. One day we had to shovel the snow from the turnips, before the poor animals could get at them.—Only three, out of twenty score, have died since they came to the farm, in October last. Mr. Jamieson says, he has often suffered at the rate of five *per cent.* through the season.

Jan. 30.—I am now preparing to depart from a place where I have enjoyed much happiness, and, seen a great deal of business; having little more to do, but to get the inventory of implements taken off my hands, and the several accounts due to the men under my charge examined and audited. These things, I confess, are absolutely necessary;—still they do not afford me satisfaction, because they remind me that I am to leave the service of a gentleman who has uniformly behaved to me like a father, and that I am, more to associate with fellow servants, from whem I received uncommon instances of friendship and favor. Duty to you, however, is a permanent principle in my breast; and though feelings cannot be overcome all at once, yet still those, which impress me at the moment, will not, I hope, in the slightest degree prevent me from enjoying the like happiness at your fireside, as I have experienced in this hospitable mansion.

The day before yesterday Mr. Jamieson sent for me from the field, and I waited upon him immediately. "George," says he, "I am more at leisure just now than I probably may be at your departure; therefore cannot employ myself better than in giving you a few advices, which, likely, may be useful when you settle in the world, or in your passage through it afterwards. In the *first* place, let me assure you, that I am well pleased with your behavior when in my service, because it has been steady, regular, and inoffensive; but on these points I mean to write my good old friend, your father, which will be more satisfactory to him than any thing communicated through your medium. In the *second* place, I recommend most earnestly, that you would take particular care of your conduct and behavior when entering into active life, because I have known many young men get a character stamped upon them at that time, which no future alteration of conduct was capable of removing. Be consistent and steady therefore in your actions,—cautious in forming schemes and connexions,—but firm and determined in the execution. Think for yourself at all times; and, though it is often wise and prudent to refrain

from communicating our thoughts to others, yet, at no time, act contrary to the dictates of your own mind, or resign self-governmont in favor of another, whose interest, and whose views, may have a contrary direction. A man who is sober, attentive, and of any strength of mind, will rarely go far wrong; at least, if he does, he will soon be recalled to duty, by the influence of conscience, that vicegerent of the deity; whereas the person, who is irregular in his conduct, and without principles to govern his mind, may be compared to a ship in a boisterous sea, unprovided with a helm: He is tossed to and fro for a few passing years, and finally wrecked upon the shoals of misery and ruin.

"In the *third* place, as a large share of every master's happiness, even of his professional character, depends upon the integrity and faithfulness of those below him, I cannot sufficiently recommend to your notice what may be called the economy of managing servants; because, by studying this art successfully, your own interest may not only be promoted, but also the welfare and comfort of the laborers in your service materially increased. Servants with all their imperfections, (and God knows no human being is altogether perfect) are rarely so bad as represented; and in many instances their defective conduct may be imputed, in some measure, to the master himself, in so far as he neglects to teach them their duty, or behaves to them with roughness or asperity. When you, George, become a master, treat your servants with kindness; and I venture to say, that, almost in every instance, a suitable return will be experienced. The best servant may fall into error at a time; but when one of this character happens to make an unintentional mistake, rather wink at the fault, than reprehend it in the manner too customary with many people. Depend upon it, more good may be done in this way, than by adopting a contrary conduct; that is, if the servant is gifted with the slightest portion of sense and discernment. The thoughtless and profligate, I would not retain on any consideration; for it is an old and a true saying, that one scabbed sheep is capable of infecting a whole flock.

"*Lastly*, I advise most strenuously, that regular and correct accounts be kept of your whole proceedings. This system of correctness I do not restrict to the mere articles of debtor and creditor, —a length to which every man goes who pays the slightest attention to the management of business; but extend it to disbursements of every kind,—to the produce and sales of your crop,—to the returns and profits of stock,—and to an yearly balance of your affairs. The pleasure and satisfaction arising from these expositions, independent of their manifest utility, will afford a full compensation for the trouble thereby given: and were I to add, that a daily journal of your transactions would also be advantageous, it would only be inculcating theutility of a practice constantly carried on at this place, since I entered upon farm management.

"Let me see you often here; and rest satisfied of receiving my best advice at all times. If disposed to write me, be assured that a speedy answer shall not be neglected. I wish you well, and trust the lessons received here, will be of advantage to you afterwards."

The foregoing contains the substance of Mr. Jamieson's advices to me, which I hope have made an impression upon my mind, never to be obliterated. My correspondence from Barn-hill shall now cease, as I expect to be with you in eight or ten days from this date; and to detail, more particularly than practicable upon paper, the many proofs of friendship displayed by Mr. Jamieson during the twelve months I have been under his protection. I am, your dutiful son, &c.

BADEN CORN AND OKRA COTTON.

To the Editor of the Farmers' Register.

Poplar Springs, Fairfield, S. C.
September 25th, 1839.

Having read and heard a great deal about the Baden corn, I obtained some of it last spring and planted it, expecting to make a tremendous crop: but, to my utter astonishment, it is the poorest corn that I have seen grow on my plantation. I planted some of it on high land, and some on good creek bottom, and neither made so good a turnout as my own corn that I have planted for several years, the seed of which I obtained from York district, in this state.

Notwithstanding the experiment which I have made has entirely failed in turning out as well as I was induced to expect, I am not altogether disposed to discredit the statements of those who have done so much with it at the north. At the north, they plant their corn about three feet each way, and leave three or four stalks in each hill, and this is the way they make so much to the acre. Here we have to plant our corn four feet each way and leave one stalk to the hill, or five feet each way and leave two stalks to the hill. The climate here will not allow it to be planted thicker. The fact is, that planting corn too thick is a fault too common among our planters.

The method of planting and cultivating at the north will not answer in a southern climate, with respect to corn particularly. I have planted corn four feet each way and left one stalk to the hill, and I have found this to answer best on high land; and five feet each way and two stalks to the hill, the best on bottom land. Some planters, however, prefer planting in the drill, with the rows five or six feet distant, and leaving the stalks from 18 inches, to 2 and 3 feet apart in the drill, according to the quality of the land. Judging, from my experience and observation, the best seed corn for a southern climate, is to be obtained from the upper parts of the Carolinas and Virginia; and I consider it advantageous to get seed corn from there every few years.

Our lands in the middle part of this state are wearing out so fast, that unless we adopt some system of improving the soil, or substitute some other crop in the place of cotton, many of us will have to desert the country and look out for better lands in the far west. I think it would be well for our planters to employ a part of their hands in the silk business, and raise more grain and stock; they would then have more time to improve their lands by a system of manuring. We are to have an agricultural convention at Columbia in November, which it is hoped will do something to improve the agriculture of the state.

Last winter I obtained two quarts of okra or

twin cotton seed, in Mobile; the two quarts contained about 7000 seed. I planted them, and not more than about 400 came up. I cannot give a decisive opinion yet with regard to this cotton; my present impression however is, that it is not much better than the Baden corn. I received a handful of cotton seed last spring from a friend, of Barnwell district of this state, which I think he told me was called the twin cotton there. It is not the okra or twin cotton, but I think it is the Petit Gulf improved; and I like it better than any cotton I have seen this season. I planted all the seed I got, and they came up very well; it is now the best bowled cotton I have. I shall call it Barnwell cotton.

Yours, &c.

JOHN J. MYERS.

SUPERIOR ADVANTAGES OF THE OLD SOUTHERN STATES FOR SILK-CULTURE.

To the Editor of the Farmers' Register.

Indian Key, T. F. Aug. 7th, 1839.

By your editorial remarks on page 355, I am sorry to see that you seem to consider me an *opponent* to the culture of silk in the United States; and that, therefore, my views ought to be welcome to all among your readers who may disbelieve in the fitness of our country for silk-culture. You will hence permit me to declare that I do heartily believe in the great fitness of our country for *bona fide* silk culture; that I do earnestly believe in the greatly superior fitness of that section of our country embraced in the old southern states; but that I also do most solemnly believe in the immensely greater superiority of Southern Florida both for the growth of the mulberry and the production of silk. During my continuance in office at Campeche I wrote very little on the subject, either *to* the United States or *for* the United States, because I saw that the topic was employing the pens and purses of many abler and richer writers. The only passage in my official letters relating to the morus multicaulis, I believe is contained in my communication to the secretary of state, dated the 23rd November, 1834;* and the facts and opinions thus and then incidentally introduced, I still conscientiously and firmly sustain. Since my return to my native country, I have joyfully observed the progress of the propagation of the Manilla mulberry throughout the *old southern states*, because I believe that the *bona fide* production of raw silk in those states will be more beneficial to them, and to the nation in general, than the same amount of raw material produced in all the other existing states of the union! But this belief is *not* founded on the *false hypothesis* that this new branch of rural industry will yield *greater profits* than an equal amount of labor and capital employed in the culture of corn or of cotton. Yet this belief *is* based on the *undisputed facts* that this new industry will occupy the poorest soils and the feeblest persons, which and who cannot be profitably dedicated to the culture of any old staple of agriculture; and that raw silk can hence be raised at a cheaper price in the old southern states, than it can be produced in the old northern states, in the new western states, or even in the new south-western states!! In comparing the whole United States with the whole of Europe, or the old southern states with the south of Europe, the only *indisputable* superiority which *we certainly* possess, for competition in the production of raw silk, consists in the much greater cheapness of our poorest soils, and consequently in the *much greater cheapness* of their produce in food for silk-worms!†

Now in comparing the *old* southern states with all the other states, it will be easily seen that you have and will retain this great indispensable desideratum of durable superiority in the primary element of *cheapness* of the raw material—of the mulberry leaves. But in the secondary element, the *cheapness* and the *command* of laborers, you have the same great relative superiority over all the other states, in the conversion of this *cheap* food into *cheap* cocoons! and consequently into *cheap* reeled silk! Now, sir, you admit that $4 a year, per acre, of clear profit, if derived from all the "poorest soils" in the old southern states "would be an immensely profitable change from the present state of things, both to the individual proprietors, and to public interests." And what was the object of the *counter estimates* of my communication, except to show that at the *low valuation* of 25 cts. per 100 lbs. of mulberry leaves, your *poorest* soils with *common* culture may *commonly* yield the value of 12½ dollars per acre? But, sir, for the sake of the southern states themselves, I should prefer a much lower valuation of the leaves; and I hope that you yourself will soon demonstrate that you can make $4 net profit per acre per annum by selling, on the trees, their leaves at 12½ cents per 100 lbs! *i. e.* 3200 lbs. of leaves from an acre of the poorest soil. I need not argue with you that New England, or any northern state, cannot afford to raise and sell the leaves of the Manilla mulberry at even 25 cents per 100 lb. Neither need I enter into details of the impolicy of the

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* "But there is another plant and product of the East Indies which can be much more profitably propagated in our tropical territory than even in our warmest extra-tropical districts, that our coldest states are actually sinning against the now established policy of the nation, and against the future prosperity of their own citizens, in continuing their war against nature, to force the domestication of the many-stemmed mulberry tree of Manilla, and of the tender silk-worm of southern China, although not more than one crop of cocoons will be the average annual reward of their mistaken labors.

"In Guadaloupe the French government sustains an establishment of 40,000 plants of the morus multicaulis, and from experiments made in that island during three successive years by Dr. Meunier of the Royal Navy, and repeated in Cuba by Professor Sagra of the Royal Botanical Garden and Pattern Plantation, near Havanna, it is demonstrated that ten successive crops of cocoons every year may be obtained from the perpetually unfolding leaves of this valuable exotic in tropical climates, and consequently in Tropical Florida. Let, then, New England send to this productive climate only one-tenth of her surplus population now unprofitably employed in the production of cocoons, and she will thus insure to the other nine-tenths, in their wintry home, a much more profitable employment in the manufacture of silk alone."

† There is yet another ground of superiority of the United States in general, and of the southern states in particular, over Europe, still greater than the cheapness of our lands. This is the dryness of our climate; a requisite for silk culture which cannot be as well supplied in Europe, by all that art and science have effected.—ED. F. R.

new western states to attempt to produce these leaves at that price, on even their richest soils. The new south-western states have an equality in climate with the old southern states it is true, but while they have an excess of the most productive soils for sugar and cotton, and a deficiency and dearness of laborers to cultivate them, they will not surely be tempted to divert any portion of their capital and labor to the production of mulberry leaves at 25 cents per 100 lbs. Yet even at this low valuation, their production will be profitable, politic, and highly desirable in a national view. In all the new states the public sales of governmental lands have thrown into private hands much more rich soil than can be cultivated in twenty years! From the commencement of the system in 1787, to 1834 inclusive, or in 48 years, the whole amounted to upwards of thirty-seven millions of acres; while from 1835, to 30th June 1837, or in 2½ years, the sales amounted also to upwards of thirty-seven millions of acres!! Until these are settled, it will be unprofitable and inexpedient for the new states, either western or south-western, to engage in the rival production of silk with the *old* southern states.

Under our free trade confederation, every staple of agriculture will be produced the most in those states where it can be most cheaply raised. The cotton-growing districts have hence been constantly travelling further south and west; and hence the silk-growing districts will finally be clustered in the old southern states. But let the southern planters "first be sure they are right, and then go ahead." Let them *not* propagate the Manilla mulberry on any soil which will yield them in other staples *more* than $4 net profit per acre per annum; and let them be content with selling the leaves at 12½ cents per 100 lb., if at that rate the morus multicaulis will yield them a net profit of $4 per annum for every acre of their poorest soils. Let both the propagator of the plant and the feeders of the worm consider the silk culture to be only a *collateral branch* of farming, like the rearing of poultry. Let them consider it only as a means of employing poor lands, and feeble hands, which would be otherwise idle and unproductive; and they may then challenge the world to rival them in the production of raw silk!! Let them also consider its importance as a means of attracting an emigrant population of small cultivators to occupy their hitherto worthless soils, and the mere value of the silk itself will shrink into comparative insignificance when taken into the estimate of the vast additions which will thus be made to their power, prosperity and tranquillity, in a thousand channels.

After all the noise which has been raised by speculators, the reflecting statesman may be surprised at the very small surface of ground, and the comparatively small number of laborers, which, with only one crop of cocoons per year, are really requisite to supply the United States—Europe—the whole world—with raw silk!! Take "the certainly not too high" estimate of the national silk convention of Baltimore; *i. e.* 51 lbs. raw silk per acre! One hundred thousand acres would then yield 5,100,000 lbs. raw silk, a quantity sufficient to supply (at the very least) *twice* the average annual consumption of the United States of manufactured silk in all its forms!! Yet 100,000 acres would be scarcely missed, if struck off the map, or separated from the jurisdiction, of old Virginia!

To raise that silk the highest estimates would employ only 500,000 feeble persons only six weeks in each year, equivalent to the steady employment of only 60,000 persons a year; that is, if we allow four days' labor to be requisite to produce one pound of reeled silk. Yet, if I have understood the calculations of G. B. Smith, esq. the highest authority in the United States, he does not make the average labor to exceed two days to each pound of silk; and at that rate the number of laborers for six weeks would be reduced to less than 250,000 persons! But take my estimate of 25 lbs. reeled silk per acre, and then 5,000,000 lbs. reeled silk will require but 200,000 acres of the poorest soils of the southern states, or about the *half* of *one per cent* of the superficies of Virginia! How does this agree with the assumption of Judge Comstock, that 35,000,000 of morus multicaulis will not suffice to supply the little state of Connecticut! when tested by the doctrine of G. B. Smith, that for a permanent plantation to make silk there should be only 2420 trees upon an acre? But as the latter signed the estimate of the convention of 51 lbs. reeled silk per acre, *less* than 25,000,000 of morus multicaulis would suffice to plant the 100,000 acres requisite to produce the 5,100,000 lbs. of raw silk. Hence let the speculators' cry of deficiency in this year's planting be ever so loud, I am satisfied that by the 1st of November there will be a *greater number* of buds of the morus multicaulis in the United States than will be requisite in the year 1840 to grow all the leaves necessary to make 5,000,000 lbs. of raw silk; and I *hence congratulate* the old southern states on the fact that the *epoch has arrived* for the *bona fide culture of silk.* Now, sir, although you believe my "estimates of profits and products to be generally too low" let us see whether they do not present sufficient encouragement to the extension of silk culture throughout the old southern states. Although you believe that I have allowed *too much* (5000 pounds of leaves) as the product to be expected from the "*poorest soils*," yet your belief that I have allowed *too little* in all the steps of their conversion into silk, induce me to believe that you do not consider too high my final estimate of 25 lbs. of raw silk per acre. In either way, the *proportionate value* of the leaves, *on the trees*, will be one-sixth, or at the cocoonery one-third, of the price of the reeled silk; and hence with reeled silk, at $3 per pound, the *leaves on the trees* (be they more or less) will always be worth $12 50 cents; "and every cultivator in Virginia knows that *this is a much better profit* than is obtained, not only from the poorest, but from those much better than the poorest soils; perhaps from half of all the land now cultivated in grain." The *very great encouragement* that I then offer to the southern states may be summed up in the *simple facts* that with the *lowest estimate* of 25 lbs. of silk per acre, at the *lowest price* of $3 per lb., or $75 per acre, I deduce the *fact* that the *value of the leaves on the trees* will amount to $12 50 cents per acre per annum on the "*poorest soils.*" The *same lowest estimates* also afford the *highest rational encouragement* to the conversion of those leaves into silk by the feeblest and otherwise least productive laborers. Deduct 50 cents for the cost of the *leaves* on the trees, and $2 50 cents remain to compensate the laborer for trans-

porting them to the cocoonery, for feeding them to the silk-worms, and for reeling the silk from the cocoons, requisite to yield one pound of raw silk, worth three dollars per pound. But to do all this labor, the highest estimate of the *time* requisite to perform it we have seen is but *four* days for a single person, for which he will receive at the rate of 62½ cents a day. And is not the gain of 62½ cents per day sufficient encouragement to induce the southern states to employ in the silk-culture all their feeble hands which would be otherwise idle and unproductive? To sum up the whole, in a few words, I insure to the old southern states the sum of 12½ dollars per acre for their poorest lands, and 62½ cents per day for their feeblest hands, when employed in the *bona fide* production of reeled silk at $3 per pound. HENRY PERRINE.

P. S. I predict that *you* will not continue to raise cocoons, *for profit*, during three successive years, when you can sell *all the leaves on your trees* at 25 cents the 100 lbs. or $12 50 cents per acre of the poorest soil. H. P.

CAUSES OF BAD SILK-WORMS' EGGS.

From the Silk Culturist.

The great demand for silk-worm eggs, and the extravagant prices they have commanded the past season, have induced many persons to lay in large stocks for the supply of the demand, which is reasonably expected to be greater another year. It is desirable that an ample quantity be preserved, in order that all may be able to procure them at fair prices; but it is more important that they be of a quality that will not disappoint the expectations of the feeder. Nothing is more discouraging to the beginner in silk culture, than a family of diseased and dying silk-worms—and such he may rest assured will be his experience, unless he takes especial care to furnish himself with good eggs. Eggs, to be good, must be laid by large and healthy moths, and be carefully kept through the winter. There is no difficulty in saving good eggs, if the proper method is pursued; but if not, they will be of an inferior quality, if not entirely worthless.

Judging from present appearances, there will be large quantities of eggs thrown into the market, the coming fall and spring, most of which will be of little or no value. We hear of individuals industriously engaged in hunting up cocoons for the purpose of increasing their stock of eggs. It is said they purchase small lots here and there, and mix them up together without regard to quality, or variety—make no selection from the largest and firmest cocoons from the common mass, but suffer the moths to eat out of all, and lay their eggs. One individual, we are told, has procured twenty bushels, or more, of cocoons for this kind of management. He will doubtless have a large quantity of eggs, and may fill his pockets to overflowing; but it will be at the expense of honest, but credulous, purchasers. The injurious effects also, which such speculations have upon the silk enterprise in this country, cannot be estimated by dollars and cents. The man who sells shad's eggs, white mustard seed, &c. for silk-worm eggs, undoubtedly injures the cause of silk culture; but in a far less degree than the man who palms off upon an unsuspecting novice, the genuine article, but of a quality, and in a condition, which renders it worthless. If beginners would succeed, they must exercise a great degree of care and caution about these apparently small matters—for upon them, their success or failure principally depends. It is believed there will be good eggs enough in market, to supply the wants of all, and we would advise all to obtain their supplies of regular and responsible dealers, in preference to hawkers, whatever may be their pretensions.

PROMISCUOUS REMARKS.

For the Farmers' Register.

Industry and economy.—Industry is of first importance, economy is second. Without industry, nothing is obtained, without economy nothing is retained. But when we speak of industry and economy, we wish to be understood as connecting therewith discretion and judgment; for industry improperly applied is worse than idleness; and parsimony is not economy.

The dwelling, the out-houses, the fences, and ditches, are all made by industry; but economy requires that they be located with discretion and judgment. The old stock of Virginians are fond of placing their dwellings on the hills; I, being one of this stock, reside on a hill, but if I may ever build again, I shall certainly locate so that I may obtain spring water at hand. My people, my horses, my cows, my poultry, could then drink pure water at will, without the trouble and expense of travelling after it, and all the otherwise worthless slops from the house, the kitchen, and privy, could be moved off by the superabundant water, and dispersed on an adjacent meadow. One hundred yards would be sufficient distance between the dwelling and stable and cattle yard; the space between should be my garden; the water should first pass my yard, then to the horses, then the cows, then on the meadow. From the kitchen I would have a second course of bored logs directly to the meadow, for the purpose of conveying, as required, the above-mentioned slops and excrements with the water, so the water for the beasts should not be damaged. Indeed, to come short at it, I have the stables, cattle yards, meadow, and water, now standing and in operation to suit my mind; all I lack is the dwelling and garden properly located.

I draw and use the water first, then in succession my horses, cows and meadow. My cattle yards are oblong squares; they are not made basin-like, as recommended by all the books, but the upper end and sides being highest, the superabundant water (either rain or stale urine) passes off, commingles with the spring water at the lower end and exterior of the yard, and is dissipated where required on the meadow.

The spring from which the above mentioned water is drawn, not yielding a sufficiency for the meadow, it is my intention shortly to draw from another and more abundant source, which will not commingle with that now conducted till they both arrive at the lower end of the cattle yard. Now if my dwelling were located at the above mentioned desirable spot, and this abundance of

water once there, there would be no need of the second set of bored logs above mentioned, and my garden and meadow would quickly repay me for the expense of their watering. Muddy water for this purpose would be best, because the mud would be manure, and such I intend to use; moreover I have a saw mill at the intended point for entering the water into logs, into which logs I can at pleasure cast the saw dust to be conveyed to, or into the cattle yard, and there prepared for manuring, by mixing it with dung. By building a reservoir with a few feet head, a large quantity of water, with saw dust or other like matter could be conveyed. By using saw dust in its natural state, it is for the first year injurious to a crop, but prepared as above mentioned, it is forthwith an excellent manure.

Fencing is a most tedious, laborious, and costly appendage to a farm, and our law which compels the farmer to fence up his crop, or in other words, to stand guard around his field, is in a civil country of all things the most uncivil. In ancient days the greater portion of the lands belonged to the king, and afterwards to the commonwealth, consequently these were a common; but now the lands are owned by individuals, and no individual should be compelled to stand guard over his property. It is my business to keep my beasts on my own premises, otherwise by the law they are estrays; yet strange it is, although estrays, and consequently depredators in the wild woods, yet if they find a field not protected, they are at liberty to eat and destroy, and their owner is clear of damage. Suppose the law were so amended as to make it the duty of every owner to keep his cattle from going at large, then our arable lands might be safe without fencing, and much cost and vexation be avoided.

In ancient time, horses were turned into the woods to find a subsistence. This has been abandoned, and to the observant eye it is also now required that cows and hogs be also enclosed; for except in a few wilderness places, there is no longer a sufficiency for their subsistence in the woods. May I not here add, that the time will shortly arrive when it will be found most economical to soil all manner of cattle; in which event, the woods which are now reserved for the building and renewing of fences, would be appropriated to grass, for the support of cattle through the year.

I reside in a country of timber and saw mills, consequently I consider post and plank fencing the most economical. Where lands are cleared of timber, and such timber not otherwise valuable, it should be used for a fence; but where stone sufficient for fencing can universally be had, no valuable land should be reserved, merely for fencing.

The farmer should consider, examine, and determine, where his fencing should be located, and where any permanent location is determined on, the fencing should be made in the most economical manner. If stone be used, the fence should be sunk below the surface of the earth, so that it may stand firmly; if wood be used, the fence should be elevated by cutting two ditches, casting the earth therefrom in the space between, and planting the fence thereon.

A circular piece of ground can be enclosed with less fencing than any other shape; a square with equal sides next cheapest, an oblong square next; corners running outward are bad enough, corners running in are miserable, and detached fields are wretched.

I will close with a few remarks on ditching. When I removed to the premises on which I at present reside, I had about $800 worth of ditching done, nearly all of which experience has taught me was useless work. It is true I drained my bottoms by those ditches, but subsequently I have cleared the banks of the creek running through the bottoms, and at intervals removed obstructions of wood and stone, by which means, in conjunction with the current, the bed of the stream has lowered, so that my ditches are dry, and consequently not only useless, but a nuisance. Where the water strikes the banks abruptly, stones are used as a protection, so likewise are stone walls used as a protection against freshets; but since there is no obstruction in and about the stream, and the bed has sunk, there is but little use for such walls.

In the general, ditches are not cut deep enough, even for meadows. Where a ditch is actually wanting, it should not be less than three feet deep, and often five or six feet would be proper. It is a common remark, "My high grounds are healthy, but my low grounds are diseased;" now what is the difference between high grounds, and low grounds, excepting the one is dry, and the other boggy? By deep ditches, your bottoms become dry and healthy, and then there is no more complaint.

MOUNTAINEER.

September, 1839.

POTATOES.

From the Genesee Farmer.

The potato is unquestionably the most valuable root cultivated by man. It is grown with little care, yields good crops, can be grown in almost every variety of soil, and its nutritive properties are not exceeded by any other root either for man or beast. Though it can be cultivated with little care, and though almost any soil will produce potatoes, there are few crops that in both quantity and quality better repay any extra attention they may receive than this root.

The potato, like most other cultivated plants, delights in a strong rich loam, and other circumstances being equal, such a soil will usually produce one-fourth more than one very tenacious and heavy, or very light and sandy. In new settled districts large crops of potatoes are grown in the soils that contain great supplies of vegetable mould; but experience would seem to justify the opinion that in such soils the quality of the potato is rarely first rate. A grass ley—clover is the best—has been found, when properly prepared and manured, to be excellent for this crop; and if the soil is rather moist than otherwise, it is considered as increasing the chances of a good yield. Countries that have naturally a cool moist atmosphere are found to produce far better potatoes than those that have a dry and high temperature. Thus Ireland, surrounded as it is by the ocean, and necessarily of a moist and equable climate, is famous for its potatoes; and of this continent, the part most famed for the quality of this root is New Brunswick and Nova Scotia, which districts are noted for the moisture of climate. With any part of the northern or middle states, however, the fault of not having good pota-

toes, or not having them in sufficient quantity, must be traced to the negligence of the farmer, rather than any deficiencies of soil or climate.

The preparation of a field for the potato is simple. If a grass ley sufficiently rich without manuring, a rare case with this crop, the sod may be carefully turned over, rolled down, and then the surface earth loosened with a fine harrow, in in which the tubers or sets are to be planted. If it requires manuring, let the manure, and this should be long rather than short, be evenly spread over the ground; with the plough make the furrow, and into this let one hand haul the manure so placed in the furrow. This row is covered by the plough and the operation is repeated till all are planted. Corn on the ley is general preferred, and roots well manured afier the corn. The first in the rotation may depend on convenience, as the turf is excellent for either.

A multitude of experiments have been made and recorded, both in England and the United States, to determine the best method of planting the seed, whether in whole tubers, or in roots cut in two or more pieces, called sets. The result of these experiments have been somewhat contradictory, yet they seem to have established the fact that whole tubers will produce rather more potatoes than sets, but not more than sufficient to balance the extra quantity of seed required where whole potatoes are used. There are many farmers who prefer sets altogether, and the probability is, that twenty bushels of large potatoes, cut into sets and planted with a proper number in a hill, would produce more potatoes than the same quantity planted whole; but the space planted would of course be more extensive with the first than the last. Mr. Rhoades of Skaneatles, an observing and very intelligent farmer, says he would not use whole potatoes, could he have them given him, for seed; and his success with sets would seem to justify the preference.

It was once the fashion among farmers to make little mountains of their potato hills; but that seems to have been useless labor, and extra hilling is dispensed with. The ground after planting should be kept free from weeds, the earth stirred with the cultivator or the hoe; but after the tubers have begun to form, the plough should not be used, as it frequently cuts so deep as to disturb the young plants, breaking off the little tubers, or causing the formation of new roots, processes decidedly injurious to the crop. The general length of the vines must determine the distance at which the rows are to planted, and this of coarse varies greatly in the several kinds commonly cultivated. If potatoes are planted in the rows nearer one way than the other, the rows should run north and south, that the sun may produce its proper effect on the leaves of the plant, and on the surface of the earth between the rows; and the same remark will hold good of corn or other plants, the rows of which should always run north and south, when the make of the land will permit.

When it is found that potatoes yield large quantities of balls, it is considered by many farmers a proof that the potato has reached its maturity and begun to degenerate: the production of seeds in all plants being indicative of this fact. Mr. Knight, the celebrated writer and gardener, maintained the certainty of the arrival at maturity, and consequent degeneration of all varieties of plants, the potato among the rest, and the necessity of occasionally renewing them from the seeds, which is the process nature itself employs for preventing the degeneracy or extinction of plants.

There are few districts in our country where favorite varieties of the potato are not cultivated, and not unfrequently the same kind is known in different places by different names. The Pinkeye, the Sardinia, the Mercer or Chenangoa, the English and Irish whites, and the several varieties of the red and black potato, are the best known. The Rohan potato, lately introduced into this country from France, promises to be a great acquisition both for productiveness and quality. But we have yet seen no potato, that, for the table, could be compared for excellence with the Pinkeye. It cannot be considered a great bearer, though it yields well; but for flavor, and amount of nutrition, we think it unrivalled.

The production of early potatoes for the markets of our cities and villages, is becoming yearly a matter of more interest to the farmer; by practising the mode adopted in England of selecting the earliest kinds, and then treating them in the following manner, described by Loudon, important improvements might doubtless be effected. The cultivators in Lancashire have found that there is a fortnight's difference between the ripening of potatoes grown from opposite ends of the same potato; that part to which the root is attached being the latest in ripening, while those that spring from the nose end, are found much in advance of the others in vigor, early maturity, and in size. Each potato is therefore by the gardeners divided into three parts, which are planted by themselves, and thus they ripen and are fit for the market together.

The potato being in its native state a poisonous plant, like many others of the tropical climates, from which wholesome nutriment may be derived, it should not be cooked until ripe, or becomes mealy. The value of a potato depends in a great measure on the starch it contains, and of course the nutritive matter greatly varies in the several varieties, and in the same varieties at different times. Perhaps there is no method that developes the quality of a potato more fully than baking. We have seen a very fine early variety, and also some superior specimens of the Pinkeye, when exposed to the heat of the oven, expand and burst like parched corn into a thousand fragments. Such roots contain little else than pure starch; and the experiments of Raspail on the nutritive action of the potato, shows that in such plants it is found in the most abundant quantity. Next to baking, steaming is the preferable method of preparing this root, and experience shows that it should never be given to any animal unless in a cooked state, if we would derive from it its full value.

Cellars in which the temperature is but a few degrees above the freezing point, or from 40 deg. to 45 deg., are the best for roots, and particularly for the potato; but they keep no where so well as in pits, covered with just enough earth to keep out the frost. Light, and exposure to the air, are injurious to roots, and in pits these are excluded. To have these roots then in their excellence in the spring, enough should be pitted for use as well as for planting. Some writers in the 'Quarterly Journal of Agriculture,' have strenuously recommended that potatoes intended for seed, should be gath-

ered before they are fully ripened, as being less subject to failure, or to disease. But we have never known in this country any thing to justify such a course, and besides, it is, we think, contrary to the course pointed out by nature herself. The average crop of potatoes per acre in the states is not large, owing to the imperfect and careless method of culture. In Susquehannah county, Pa. in 1838, the average of 2,400 acres, was 170 bushels per acre, which we presume exceeded the average of many other sections of our country. Now, in ordinary seasons, and with decent culture, the average should not be less than 300 bushels per acre; and when we remember that many instances have occurred of from 500 to 1000 bushels per acre, such an average could not be deemed extravagant. More manure and less land, would doubtless increase our potato crops, as well as most others.

BREEDING SWINE.

From the Franklin Farmer.

Buffalo, N. Y. August 31*st*, 1839.

Sir.—Agreeable to the intimations in my last, I now come to the rules adopted by the most successful breeders of Berkshires in this vicinity. Your readers will excuse my particularity in stating them for the reason that the article of pork, as before asserted, is the most important item of western agricultural production, and that I am writing to those who are not *above* their business, but who take the same pride and pleasure in raising a fine race of hogs, as they would in that of blooded horses or Durham cattle.

A boar should never be permitted to be used till seven months old at least, and it would be much better that he were allowed to run till nine months. But if commencing at seven months, he should cover sparingly, say not more than fifteen or twenty sows till a year old, and these as distant apart as possible--one or two only in a single week. From this time till he has attained pretty full vigor, which should take place at about eighteen months age, he may be used a little more freely. His spring seasons might then vary from twenty-five to thirty sows, and his fall nearly double this number. In the meanwhile he should be kept with care. A strong door may open from his pen into another, to which the sow is introduced, the boar is then let in and allowed one coitus only, immediately after which he must be turned back, and the sow taken away. It has generally been noted that one covering produces a greater number and stronger offspring than two or three, and that an *ad libitum* service, is likely pernicious to all parties.

The best food for the boar during the season, is boiled or soaked corn, with plenty of pure fresh water, and for a variety, some swill from the house with meal in it (oat is the best) and a raw or boiled vegtable root or two, and as an antidote of disease and to give tone to the appetite, and assist digestion, a table spoonful or so of sulphur is occasionlly put in his food. Salt is also placed where he can get at it when he pleases, and charcoal or small chunks of rotten wood, together with a handful of crushed bones, if convenient, is thrown. He must be kept up alone in his stye under close cover with a plank floor and plenty of dry litter, the sleeping apartment communicating with a good yard to exercise and root and wallow in, and a strong post placed upright near the centre for him to rub against.

During the interim between the spring and fall seasons, it would be greatly conducive to the health, vigor and longevity of the boar, if he could have a run in a cool grass pasture, with clear sweet water passing through it, and take lighter food than when in service, but yet sufficiently nutritious to keep him in fair store order. A good animal thus treated, may last ten to twelve years, and get excellent stock from first to last. But great care must be taken that he be not *over-worked;* this is deemed very essential. It is the great fault of us Americans, that when we have obtained a male that has any way distinguished itself, instead of husbanding its resources, we use it too much, and this is one great reason why the stock of such animal so often disappoints the public. I understand that particular English breeders limit their best horses and bulls to about thirty females, and often as low as twenty or five and twenty. What their usage is for boars I do not know, but suspect that it would be less than here allowed. It will be admitted however, that individual males may serve well a greater number than limited above, but my principle is, not to work them up to their full capacity; if error must be committed, it is better that it be on the safe side.

Unless a sow were very coarse, and the object was to fine her, I would not allow her to breed at eighteen months old; and if something extra was desired, she ought not to come in under two years, there is then no check in growth, and the first litter is usually as good as any subsequent one. She ought to be taken up and occupy a place alone, either in a pasture or a pen similar to that described for the boar, one month previous to farrowing, her condition kept good and strictly watched when expected to bring forth. As soon as dropped, see that the pigs are cleaned and take the teat, and the dam rid of the placenta, and that carried off and buried. The watching should continue a day or two longer, till the pigs get a little stronger and lively, as the sows of this breed are so heavy as to endanger their being lain or trod upon and killed. One pig more saved, than leaving the sow to herself, amply repays all this extra attention. Although objections are made to giving food immediately after farrowing, I can see no reason in them; the poor animals is faint and dry, and requires nourishment, and my rule is to feed them swill in a moderate quantity, a little more than blood warm, as soon as it will get up and eat it. This is gradually thickened the next day, and by the time the pigs are a week old, the dam is allowed to eat all it will without cloying. A mixture of oat and pea or Indian meal, of one part of either of the latter to three parts of the former, is highly recommended for nursing, together with an equal quantity of steamed vegetables. As soon as the pigs will eat, a small open door should be placed in the pen under which they could run and be separate from the sows, a trough set in, and milk with a light mixture of oat meal poured out for them. This greatly relieves the sow, and adds much to the growth of the pigs; they wean then without scouring, losing condition in the least, or being checked in their growth. It is generally thought that pigs do as well to be weaned at six weeks old as later, as the little milk each then

gets is obtained by more or less quarrelling, and adds a distaste to their other food; besides it is a great consideration to get them off the sow as soon as possible. Eight or ten great pigs tugging at her breast for two or three months is hard to be borne, and frequently very pernicious to her teats. In weaning, all but one should be taken off, put the dam on short allowance, and in two days take the remaining pig away, allowing it at first to draw the breast twice a day, and then diminish till once in two or three days during a week, then turn the sow out to grass, and leave off entirely and commence gradually putting her into condition again. The Berkshires are great milkers, and must be well attended to at weaning time, or their breast will fill, become caked and swollen, and finally ulcerate and be the cause sometimes of the death of the sow.

Two litters are allowed per annum, and preference for farrowing, in this climate, is given to the months of April and September. Farther south later and earlier will answer. A pig when first dropped is a very tender animal, and if the weather be too cold it will perish; the dam also is likely to become ravenous and devour her offspring, or refuse to nurse it. Sows are better to be always separate; but with the owner of a large herd, this is inconvenient, and adds greatly to the expense of keeping them. One must do as well as he can in this particular, but when nearly of a size and tolerably peaceable, four may be kept together in a pen, and a dozen or so in a pasture. The breed greatly decides on this point. For instance, I could keep a hundred Chinese together without quarrelling or accidents, they are so good natured and quiet; but then again they huddle too close, and so want as much separating as others. These being smaller and of quicker maturity than the Berkshires, the sows may come in at a year old; and when full grown, great care must be taken about overfeeding and keeping them too confined. The bellies of this stock are now nearly dragging on the ground, though they have had no other food since the forepart of May, than what they have found in a poor grass pasture. Those I have sold west get so fat on shack by November as to be hardly able to waddle, and make the nicest of pork without further feeding. In England they are called par excellence, the "gentleman's hog," and though their pork inclines rather too much to fat, still it is so sweet and delicate that it is more generally preferred by those who can afford it. The crosses of these with the Berkshire are in great repute at the Smithfield market, and I will add that what little has been thus made here takes the preference. The hams well boiled and eaten cold, seem absolutely to dissolve in the mouth without mastication. The average weight of my improved Chinese may be at eighteen months old from 200 to 250 pounds. Occasionally they will go older to 300 and even 400 pounds, but this is very rare. Though small, they have proved to the other races of hogs, what the Arabians have to horses, the foundation of all improvement.

The reader will have surmised from my observations on breeding, at least some of the causes why the Berkshires with you have not came up to the full sizes so often stated by the eastern breeder that they arrive at; but lest he may not yet thoroughly understand the demerits of the case, in justice to both seller and purchaser, I shall proceed to briefly state them. Suppose then that we start with a pair of Berkshires from unexceptionable stock, the produce may deteriorate in size, either from too great affinity in blood of the parents, breeding too young, too old, or too much. Keeping too fat, (which by the way is not often the case,) too poor, or too confined; from diseases known and unknown, from runts that will occasionally be dropped, from scantiness and impropriety of food to the pig, and occasionally, over which no one has control and that check its growth, from sufferings through the inattention of the transporters to its place of destination, and finally from a general deterioration in nature. Really good animals that are every way right, are rare, very rare indeed, and when at last obtained, cannot be too highly cherished. That there may be an increased effort to produce them throughout the United States. is the ardent desire of,

Your obedient servant, A. B. ALLEN.

A PATTERN FARMING TOWNSHIP.

From the Farmers' Monthly Visiter.

Until within a few days the editor had never visited the town of Rye in the county of Rockingham, This town is situated next southwest from Portsmouth, stretching on the sea-shore six miles, and is of an average width of two miles, being one third the size of a common six miles square township. A considerable portion of its superficies is the sand beach of the sea. Its soil now in cultivation was originally hard beyond that of the rocky soil of the interior, with a pan approaching near the surface like the face of the rock itself, or else it was swamp and morass. Thirty and forty years ago the inhabitants pursued fishing as their principal occupation; and the larger portion of them were poor: it is also said that many of the fishermen, being intemperate, left their families almost in a state of destitution. The change that has since gone over them is wonderful. There is not now probably in the state a more industrious and moral community than the twelve to fifteen hundred inhabitants of Rye; and although there is no community of farmers in the country more frugal and economical, scarcely an individual among them being willing to part with a fourpence-ha'penny without the assurance that it will bring back a nine-pence, yet the examples of generous charity among them are such as are worthy of imitation from those who part with their money with much less reluctance. Most of the owners of farms with their sons do the work upon the farms: if one of them is taken sick and unable to do his work in a busy season, enough of his neighbors leave their own work for one or more days to assist him, and his haying or his hoeing is performed at the proper season, "without money and without price.

The superabundant rocks in this little township have for the most part been converted into excellent permanent walls, partitioning out the grounds into convenient fields of from two to twelve acres. We met in the town the three selectmen or "fathers of the town," who were in session to close up the business of the year. These gentlemen were a true specimen of the hard hands and intelligent, honest faces that are characteristic of the tillers of our soil. With them, and the excellent friend

to whose kindness we were indebted for their visit, we ascended the steeple of the large congregational church, which has been erected more than one hundred years, and from the top had a view of the almost countless stone-wall partitions, and of fields upon which piles of manure in preparation for the coming season had already been placed. The sea, the Isles of Shoals, on one of which is the White Island light, the Whale's Back and the New Castle lights, further on the steeples of Portsmouth, and in a transverse direction the harbor of Rye, being a bay formed as the estuary or mouth of a small creek running through the town, were visible to the naked eye.

From the observations made, as well as from information, we do not doubt that this little town of Rye turns out more value in the production and growth of the soil than any other town of the state. The farmers here seem to have studied in their own school of experience, which has taught them the best method of cultivating their ground. Hundreds and sometimes thousands of ox-loads of green sea-weed are annually thrown upon the beach; every storm with the wind blowing directly upon the coast brings this along; and there is competition among them which shall secure the most of this article. It is of itself the very first-rate of manure, and is either spread upon the surface before ploughing, or else upon the sward where grass is to be mowed. In addition to this sea weed or kelp, the farmers of this town within the last few years, having commenced the ditching and cultivation of swamps containing a deep vegetable mould, drawing out the matter taken from these ditches in the fall or winter to be spread over the ground along with the sea weed. This rich black mould is thrown in heaps at convenient distances, at the rate of a hundred stout cart loads to the acre: the vegetable mould under the operation of severe frost, swells and pulverizes like slacked lime. With this and the vegetable weed from the sea, and in some instances on low ground with heaps of common stone gravel, such as hard roads are made of, the largest crops are obtained. The corn is larger than that raised in the interior on the best grounds: great oats follow as a succeeding crop to the corn. But potatoes for shipping are the great staple: these the last year, carted directly from the field, sold at forty cents the bushel. In a good season, three and four hundred bushels are yielded to the acre. Some of the farmers raise three and four thousand bushels each. Most of the farms are very small in compass: thirty acres would be deemed a large farm; and it has been common for a farm of thirty acres to be divided among two or more sons of the same family, and all of them soon increase their products so that each partition will yield more than all of them did together.

In the country we have seen no such cattle as we saw at Rye and the adjoining town of Hampton. Real working oxen yoked in the teams seemed to be fatter than the fattest of those we are wont to see driven through Concord from the north and west part of the state, and from Vermont for the Brighton market. The farmers of Rye are certainly more industrious than many of the farther interior. They are working their teams constantly in the winter, preparing as well their grounds for cultivation by carting manure, as procuring their annual stock of fuel. In the article of wood and timber the people on the seaboard are much better supplied than they were fifty years ago. The white pine is more usually than any other wood used as fuel; this is of the second growth, the trees having attained almost the size of some of the original pines in the space of a few years. The but logs up to the knotty parts are saved to be sawed into boards and plank, or for hewn timber, and the limbs above are cut and split, making good fire-wood for the stove when they become seasoned. The pines are preserved with all the care of a garden-orchard, as are the hardwood trees in uncultivated swamps: the growth of these will yield a great annual profit on a high price paid for the land.

The farmers with a small amount of land usually keep at least two yokes of oxen, and turn them off very fat at the season when good beef for the market will bring the best price, supplying their place oftener with other oxen furnished by the country than by young cattle of their own raising. Considerable pasturage for cattle is either owned or hired out of town, the land being taken up with more favorable cultivation.

The cultivated lands of this town sell from one to two hundred dollars the acre, and sometimes even beyond that price. The inhabitants of the town change less than is usual in the towns farther interior. Seldom does the property pass out of the family. A vast deal more in value is annually produced in the town than is expended in the town, so that the people necessarily must be growing rich: the annual increase of the capacity of the land from its improved cultivation is a great increase of the wealth of the town.

Could the farmers of all our towns realize the extent of the advantage gained by so cultivating their ground as to make every acre produce two or three for one—could they witness what has been done by the industrious farmers of Rye—few of them would fail to make efforts to elevate themselves, and their calling, in that easiest method which human ingenuity can devise.

ON THE MANURING OF ARABLE LANDS BY THEIR OWN VEGETABLE GROWTH.—ROTATION OF CROPS.

(Continued from p. 564.)

No. II.

Different advantages of green and dry vegetables, as manure, compared.

Though few farmers in this country had adopted or even tried the practice of ploughing in green vegetables for manure, no one doubted their efficacy, if so used. The objections to the practice would have been raised on other grounds—such as the costliness of the mode of manuring, by all—and by some, in addition, the fear of injuring the previous fertility of the soil, by turning it up by the plough in summer, and exposing the new naked surface to the supposed danger of exhaustion by evaporation. But when Col. Taylor first announced the novel scheme of manuring the fields by their own *dry* vegetable growth, it was met by general doubt and incredulity, or by confidence of very slow growth. Before that time, there was very little manure made on any farms in Virginia, and the

litter used as part of the materials of that little, by most persons, was furnished merely (and very scantily for that purpose) for the comfort of the horses and cattle; and was considered as useful to absorb the liquid animal excrement, and thus save it from waste, but as adding very little to the richness of the bulk. Still more difficult was it for the teacher to gain confidence in his claim for the *superior* richness of the mature and dry herbage to the same when in a green state. He maintained that the vegetables had not gained their full value, until their growth was completed—and in that he was certainly correct. But even though the entire plant, when fully ripe, (and, possibly, even when dry,) may contain more richness, if converted to manure, than when green and unripe, there are other things which ought to be considered. In the first place—the seeds, then formed and ripe, have been furnished, for their formation, with much the greater part of all the manuring strength which before had been spread through all the other parts of the plant; and these seeds, which if dead, might act as manure, being alive, would germinate, and instead of enriching the ground, would produce weeds, to the greater or less damage of the next crop. Secondly—to form the seeds is the great effort of vegetation, and which makes by far the heaviest draught on the productive power of the soil. If, therefore, it were convenient and serviceable, for other purposes than fertilization, to plough in, or even to mow and take off, a green crop when in its flowering state, its growth up to that time would have taken very little from the soil, and its value (whether for manure or as a crop,) would be almost entirely derived from atmospheric support. Thus, if less be gained by using the crop too early to let the seeds form and fully ripen, the cost to the land of producing the crop, would be in a still more reduced proportion. The fact (which science has completely established,) that plants draw much from air and water, and but little upon the richness of the soil, before forming their seeds, induces me to think that early mowing the first crop of clover would detract less from the value of the vegetable manure, than it would furnish of value in food, and do service by the scythe destroying the seeds of such annual weeds as cockle, spelt, cheat, &c. And if the gain from the crop of mown grass, and of the same if allowed to ripen for manure, be equal, or nearly equal, the choice of the former ought to be induced, by the consideration of the one practice leading to clean tillage and clean crops, and the other, to the foulest of both. Another thing is, that if the first crop of clover be mown before forming seeds, the second crop is so much the heavier, because of the first not having exhausted the soil to form seeds; and, being freed from the annual weeds, may be ploughed in, unmixed, as manure, before ripening seeds again, or afterwards, according to the condition of things desired.

But if the seeds of the grass or other crop of manure, could be fully given to the earth, and as manure, by the decay of the plants, and if the seeds of weeds could be kept from sprouting, I should then go even beyond the great founder of this system, in urging, and in preference, the leaving of the vegetable cover to die and decay on the surface. For he feared much loss from evaporation, in the exposure of all putrescent manures on the surface of the earth. With him, to *cover* manures by the plough was to *secure* them; to leave them on the surface, was to lose a great part of their enriching parts. In this opinion, I do not concur; but on the contrary believe, that, (if on soils capable of receiving and fixing more fertility,) the imitation of nature's mode of manuring, by letting the vegetable growth drop and decay on the surface, and year after year, will be better for fertilization, as well as for saving of labor; and that no great loss is to be feared from evaporation. The application of Taylor's doctrine led him into the great error of directing the laborious and yet injurious operation of ploughing summer cow-pens, as fast as they were moved. By this ploughing, which he did to secure the highly putrescent dung from wasteful evaporation, he quickened fermentation, by supplying the moisture which would otherwise have been wanting for that natural process; and the surface being naked, and no growth springing to take up the manure as it was decomposed, it would be indeed principally wasted, and in consequence of the very means so carefully and laboriously applied to prevent that effect. Manuring by top-dressing, and especially on young clover which is to be itself given to the earth as manure, and which is the best possible mode of applying manure, had not been practised or proposed in this country, when Taylor wrote; and it is directly opposed to his theoretical views, as well as to his practice.

Another question connected with this subject, and which must bear on any plan of ploughing in green manures, is, whether the soil loses fertility by being turned up by the plough, and exposed naked to the sun. With my great teacher, Taylor, I long held to the belief in exhaustion being so produced; and supposed that all summer tillage of corn, and fallowing for wheat, must greatly lessen the previously acquired productive powers of the soil so exposed. Other views have been more lately adopted, founded upon the theory of the causes of fertility and barrenness in soils, as set forth in the 'Essay on Calcareous Manures.' A necessary deduction from this theory teaches that in a properly constituted soil, the manure stored therein is fixed by calcareous earth, and both the calcareous and the vegetable matter chemically combined with the soil—and therefore not subject to waste by the ordinary exposure to the sun, when ploughed up. But if a soil is so constituted as not to have the power of combining with the vegetable matters mixed with or applied to it, as these matters are decomposed, they will be lost to the soil; and as ploughing them under in summer will hasten decomposition, and still more the frequent stirring and removal by the plough, so these operations will hasten the loss of the manure present. According to these views, the summer ploughing of land will serve to still more impoverish a bad soil, but do no harm to one properly constituted. And if the soil be properly constituted to combine with putrescent manures, (which is essential to any considerable or profitable improvement by such manures in any manner of application,) then the choice between ploughing in vegetables green or dry, or leaving them on the surface, should be directed by considerations of economy of labor, and suitableness of the particular process to the general rotation, more than by any absolute and uniform superiority of the one plan to another.

On all very poor lands, and which have been

made much poorer than their former natural state by severe cropping, to plough in green annuals of any kind would be of more expense in seed and labor than of profit in increased fertility. And green clover, to be turned in for wheat fallow would be out of the question, because clover could not be produced on such land. The seeds of weeds would here be but a small evil, because of their small product; and a scanty cover of weeds would not be much protection to insects. Hence, for these reasons, dry vegetable manuring, and long intervals between the use of the plough, should here be adopted.

On much better land, and of soil well constituted by nature to retain putrescent manure, or made so by the previous application of calcareous manures, cleansing will be as necessary as enriching; and therefore it will be preferable sometimes to mow, and at others to plough in green crops, both of clover and of annuals, both for cleansing and manuring, and for making the rotation as much as possible conducive to the three great objects of enriching the land, cleansing the land and its crops, and yielding the greatest possible net product.

It is remarkable, (and would be astonishing to all, if the fact were not so common, and offered to the observation of all,) that every soil is so filled with seeds of weeds, that the longest known tillage, or continual close grazing, or the mixture of the two, according to the former general exhausting system of this country, has not destroyed any where the seeds of weeds, or prevented a single square yard of arable land being covered by some kind of spontaneous vegetation, as soon as tillage is intermitted long enough for any thing to grow. On the poorest and most worn-out land, on the first year of rest, the growth may be scarcely any thing but the dwarfish and slender spired "hen's-nest," or poverty grass; but still this light cover is distributed so fully over the land, that not a spot is left naked. I speak not of the broom-grass, which follows on such lands, nor of any other which like that has winged seeds, which may be wafted by the winds to great distances—but of seeds not thus provided for transportation. On our dry light soils of middling and good quality, after wheat has been reaped, the land is usually soon covered by a general and thick growth of *carrot-weed*, which rises from two to five feet high, in proportion to the strength of the land. Yet this vigorously growing plant, which has such complete possession of the land, disappears with that season, and will no more be seen, to any extent, on the same land while it lies untilled; nor until again produced in its former and short-lived abundance, by the recurrence of the former circumstances of corn tillage followed by a crop of wheat or other small-grain crop. In like manner, and under other peculiar circumstances, other grasses or weeds have almost exclusive, but only temporary possession of the land. Among the growing crop of corn, or other ground if well ploughed and cleaned of all other growth in June or July, the vulgarly called *crab*, or *crop-grass*, springs up, and grows with a luxuriance proportioned to the richness of the soil and the moisture of the season. When much favored by both the latter circumstances, this grass sometimes also follows wheat. But it never continues to keep longer possession of the land, and is rarely seen in luxuriant growth, except where the singular preparation is used of thorough tillage, designed to destroy all vegetation, in the early part of summer. This is one of the best grasses of the southern states, and sometimes furnishes to the scythe a heavy crop of excellent hay, in autumn, from some spots in the corn field; and it would be one of the most valuable grasses for hay, if its growth could be obtained year after year, and without the expensive mode of preparation which it requires.

Many other weeds, in smaller quantities, spring up with and accompany the carrot weed; and fox-tail grass, another autumn grass, has the same habits with, and grows like the crop-grass. I have only aimed to cite some of the most remarkable, for quantity and regular recurrence of growth, even though the manner of tillage and long continued other treatment of the land would seem sufficient to have destroyed every seed. Of course then, these and other weeds alike in this remarkable respect, are not to be expected to be eradicated, nor scarcely thinned, by any degree of perfection of cleansing tillage. Nor is it desirable; for these growths serve admirably to fill up intervals in the rotation of crops, and give in some degree the benefit of a green manuring crop interposed between two exhausting, and otherwise successive grain crops. In the absence of clover, or as its more rapid precursor, the usual growth of carrot weeds, which immediately follows the wheat crop, is in fact a secondary and green crop added to the rotation for that year; though probably few cultivators have so thought of the benefit, and counted this additional crop of their rotation, thus given by nature.

The most remarkable and beneficial green crop of this kind, is the Magothy bean, which covers all the light lands of the Eastern Shore of Virginia, as soon as the oat crop is taken off. This universal and luxuriant cover (for such inferior lands,) is in fact a most valuable green and enriching crop added to the otherwise murderous rotation (of 1st year, corn, 2nd year, oats,) of that part of the country; and the wild bean which fills up, and mitigates the rigor of the rotation, will not grow if more rest is allowed to the land, than in this scourging course of a grain crop taken off every successive year.

Thus, nature, by operations which are scarcely valued, or even noticed by man, works to counteract and prevent the utter exhaustion which the usual modes of cultivation would certainly and speedily produce, but for this bounty of nature in continually supplying resources for resuscitation. In fact, in the long continued wretched course of tillage which has been and indeed still is most usual in this country, there has been more or less of vegetable manuring, either green or dry, in every rotation; but it has all been the work of nature, permitted by chance, and in spite of every effort of the cultivators of the soil—whose only object was to get as many grain crops as possible in each round of the rotation, and to destroy as much as possible, all other vegetation.

The desultory observations in the preceding pages lead, though by devious and irregular progress, to a comparison of the views therein presented with the different rotations of crops in use, or recommended. Such will be the purpose of the following number. E. R.

No. III.

Application of the principles of the rotation of crops.

There is scarcely any condition of agriculture, in the least degree advanced, or improved in operation, which is not based on some rude system of rotation, or succession of crops in a certain order. It has long been known, and almost universally acted upon, that, as to grain crops at least, the same kind could not be produced successively on the same land, without a rapid decline of product, from some other cause or causes besides the mere lessening of the fertility of the land. For when land so treated, and so reduced in product, was put under some other crop, the product of such other crop was greatly better. Therefore, except in the earliest and rudest cultivation of a new country, no where is there to be found cultivated the same grain crop, for many years in succession, without the interposition of some other crop, of other grain or of grass. Cotton is the only tilled large crop in this country which has not been alternated with other cultivation, and which is tended for years together on the same land. This practice is recommended by the clean condition of the land required by that crop, and which its repeated culture secures. But it may well be doubted whether the diseases and enormous losses of product in this crop, are not to be ascribed to its being continued so long on the same land.

But though every farmer uses something of a rotation, still the most usual courses of crops are very imperfect and highly objectionable; and there is scarcely any scheme of rotation which does not offend greatly, in some of its features, against the correct principles or theory of rotation.

The fact of the certain and rapid decline of product of any one crop repeated year after year on the same land, was universally conceded, and the practice generally abandoned, by practical cultivators, without their troubling themselves to investigate the causes. Theoretical and scientific agriculturists have entertained different views at different times, and each has had its reign. Formerly, it was supposed, and generally admitted, that each plant drew from the soil some food peculiar to itself, and thus rapidly exhausted the soil of this its own peculiar nutriment, while there still remained unconsumed, and in abundance, the food to support plants of other kinds. But though this theory passed current long, without dispute, because it served to explain the effects produced, it was gradually weakened, and finally overthrown, by later and more correct views of the nature of the food of plants. It is but within the last few years that a new and opposite doctrine has been started, which is at least the most *in fashion* at present, if not the most generally received. This is founded on the discoveries of Macaire, De Candolle, and Towers, of the *excretions* of plants by their roots; and the inference thence drawn, that the rejected excrement is fit to serve as food for other plants, but is useless, if not absolutely hurtful, to the kind from which it was thrown off. And hence also would follow the necessity for a change of crops.

Without denying or advocating either of these doctrines, I will yet add to whatever may be the main cause which calls for a frequent change of crops, *another cause*, of at least very considerable operation, and which has been already named in the first of these numbers. This is, that every plant is subject to be preyed on by its own peculiar tribes of insects, which are continued to be supplied by their proper food, and favored by the still continuing circumstances of the field, and therefore are increased continually in numbers, and in their destructive ravages, so long as the crop which fed them, and the circumstances which favored them, remain unchanged; and that these insects must be destroyed, or greatly reduced in their numbers and powers of mischief, by a total change of the growth, and of the treatment and condition of the field. Perhaps these depredators may be invisible, from their minute sizes, and yet so numerous as to cause any extent of injury that is found to be suffered by unchanged tillage of any one crop, and which is avoided by convertible husbandry, or a rotation of crops.

But luckily, though the causes of such evils may be uncertain, the effects and the remedies are not therefore unknown. And the observations of both scientific and practical agriculturists have served to establish what have been termed the *principles of the succession of crops*, which furnish a body of rules by which to test every particular scheme, and show its advantages and defects. But though most of these principles and the rules founded on them are universally received, still perhaps every writer and reasoner upon rotations differs in some important respect from all others; and my own views, and still more the rules and applications founded thereon, which have been and will be offered in these numbers, have no authority, either in previous precepts, or examples of practice. The adoption of the above named and new reason for a rotation of crops, would alone require the introduction of new rules in determining a proper order of succession, and a considerable departure from the stated rules prescribed by any previous writer on this subject. But though the principles and rules laid down by every modern and well informed agriculturist may have differed in some respect from all others, and even if all were wrong as to the main *cause* of the necessity of changing crops, still all were right, in the main, in their general precepts and rules of ordinary procedure.

But though many scientific writers have laid down the principles of proper successions of crops, and all modern agriculturists in writing, or in practice, have advocated particular rotations, still scarcely any two agree fully in their rules; and agreement in practice seems more the result of old custom, and neighborhood example, than of thinking and reasoning. It is manifest that no particular course of crops can be prescribed as the best for an extensive agricultural region, nor even for the fields of different soil on the same farm, nor for the different conditions, at different times, of even the same field. It is as much quackery to direct the same rotation for an extensive region, as it is to prescribe the same medicine for all diseases. When we hear of a particular rotation (no matter what,) being generally pursued throughout a large district, it is pretty good evidence that the rule is pursued from custom, and not by reason. Some of our best farmers have no regular rotation, though always aiming to observe the sound principles of the succession of crops, by varying the succession according to the changes of circumstances.

But if neither reasoning nor precept can point out always a right or perfect rotation, it is easy enough to learn from both what is wrong and injurious. And we can scarcely find any regular rotation in this country, which does not offend against some admitted principle and rule, and the most common have scarcely one redeeming quality, no matter by what test, or principles, the practice be tried.

The most important, and indeed *indispensable requisites* of any good scheme of rotation, or course of crops, I take to be the following; and the observance of them may be termed the *three primary rules for rotations.* 1st. That the several crops which form the course, are among the most *profitable to the cultivator*, in the circumstances in which he is placed, of climate, soil and market. 2nd. That the whole course of crops, taken through, is *profitable to the land*—serving to increase its productiveness, if poor—and at least retaining its productiveness, if already rich. 3rd. That each crop in the rotation *serves to prepare for and aid the cultivation and production of the next* which is to follow it, instead of obstructing either, or both.

The two first of these requisites, either expressly or by implication, may be considered as embraced in every theoretical scheme of rotation, and aimed (however ineffectually) to be preserved in every judicious farmer's practice. The third is almost disregarded by all, and is certainly not by any placed in the important position, or viewed in the light, which I think it deserves.

If all these three requisites be secured, any rotation will be good; if either be neglected, or be but imperfectly secured, the rotation will certainly be a bad one. The best devised rotation for the improvement of the land and its products, and perfecting the tillage, would be inadmissible, if any of the crops were of such kind as not to be either sold, consumed, or otherwise profitably used, by the farmer. Neither would the greatest annual sales justify another rotation, if it worked to impoverish the farm. And even if the *kind* of crops were to be the most profitable, and the improvement of fertility regularly advancing, what will it profit the proprietor, if the rotation operates to produce weeds and depredating insects in such numbers as greatly to increase his labors, and also to diminish their products?

Scientific agriculturists have laid down so many principles, or rules, to be observed in planning rotations, that it is impossible in practice to observe all, or perhaps half of them. Thus the English writers insist, perhaps more strongly than on any other point, that green (or grass and roots, or leguminous) crops, and white (or grain) crops, should regularly be alternated. Others, that tap-rooted plants should alternate with fibrous and shallow rooted. But all these are minor considerations compared to the foregoing; and each or all of them might come in conflict, in the circumstances of this country, with one or more of the more important and indispensable requisites.

The first rule which I have above stated, that the crops should be among the most profitable to the cultivator, is almost the only one which directs the farmers of this country; and yet even that object would seem to be lost sight of, in the miserable and futile means used to reach it. The nature of the soil and its absolute unfitness for other crops, had generally caused the selection of some one or more suitable crops for each agricultural region; and when once thus forced upon the cultivators, the custom of the place has made this course of cropping general, if not universal, through that region, though numerous exceptions, even if the general rule were good, would be demanded by differences of soil, or of other circumstances. Thus, Indian corn is the great crop of lower and middle Virginia, followed by wheat in the upper and richer part, or by oats where the soil is quite too poor or too sandy for wheat. A young farmer, who commences operations without any consideration of the wants of his soil, or of the market, adopts the usual crops of his neighborhood. If wheat be the small grain generally raised, he sows it even on his most sandy and his wettest arable lands. His corn-culture is as large as his land and his labor permit, and is pursued without change, even though some years the market price may be (as it has been in lower Virginia) less than 25 cents the bushel. Yet during this time, and every year, Irish potatoes, brought from New England, are selling in all our towns, (and bought too by many of the farmers,) at $1 the bushel; and thus the product of 20 acres in corn, or in wheat, is exchanged for that of half an acre in potatoes. Yet we can make, in lower Virginia, as good potatoes (I have often seen better,) than any brought from the north. By a still more unaccountable improvidence and absence of all calculation, hay-making is totally neglected, even on the rich and wet low-grounds of the Roanoke; and where the soil is the most admirably suited for grass, it is regularly and most laboriously ploughed and tilled, to produce bad and very precarious crops of grain. And, to come to smaller and more frequent departures from this rule, we may see on almost every farm which has various soils, the most intractable clays put in corn, which requires a sandy soil—wheat on sands—the steepest lands and most liable to be washed, subjected to the plough, and also the wettest spots, even though their laborious tillage may obtain scarcely any product of grain. The observance of these neglected minor points (and yet very important to profit,) would alone produce a great reformation in our farming.

The second requisite, (that the course of cropping should permit the improvement of the land,) is aimed to be secured by but a small proportion of our cultivators; and the third rule by still fewer.

Under peculiar circumstances, either one of these requisites may be so increased in importance, that the others may be, and ought to be, for profit, comparatively neglected. Or the object of either may be made so easy by peculiar circumstances, and by the use of means not belonging to the farm, that the otherwise necessary security of that object, from the rotation, may be neglected. Thus, where the neighborhood of a town offers to a farmer regular demand and high prices for roots and hay, and dairy products, it would be foolish for him to make grain or tobacco his most important crops, which others, at ten times his distance from market, could produce even more cheaply. And with the means of purchasing town manures, he would wisely adopt what would otherwise be a too severe and exhausting rotation of crops.

I shall now proceed to subject to the test of the three rules which have been laid down, the most common rotations of eastern Virginia, as well as some other schemes which may not yet have been

tried sufficiently, if at all, in practice, but which seem better adapted for profitable, easy, and enriching cultivation.

The first and most humble attempt at a rotation in this country, and the one which formerly was general on the greater part of most farms, and is even now in extensive use, is the *two-shift;* which, however, short as it is, had various grades of bad quality. This usually followed the *continual* cultivation of the land, in its newer condition, in tobacco, while rich enough for the crop, and afterwards in corn, every year.

The two-shift was most usually this:

1st year, corn—

2nd, { wheat—or oats, if on land too light or too poor for wheat—
after harvest, grazed closely until next spring, when ploughed for corn again.

When too poor to bear any small grain crops, that part of the course was omitted on such poorer spots of the field, and afterwards on all—thus changing the rotation to

1st year, corn—
2nd natural cover of weeds, grazed.

When not grazed the second year, as was sometimes the case, for want of separate fencing, or some other cause, this rotation made a nearer approach to alternate and improving husbandry. It was then

1st year, corn—
2nd, weeds not grazed, and which (if not burnt off, as was done most usually,) formed a very poor *manuring* crop.

The celebrated Eastern Shore rotation, is of two-shifts or fields, but of three crops, in the two years. This is

1st year, corn—
2nd, { first crop, oats—
secondary crop, Magothy bay bean—

a spontaneous and close cover immediately succeeding the oats, and which remains mostly or entirely untouched by the grazing stock, and is ploughed under for the next crop of corn. The interposition, by nature, and not by the design or industry of the cultivators, of this leguminous and manuring crop, is a most valuable feature in a rotation which otherwise would be altogether exhausting and destructive. The moisture of the air, no less than the sandiness of the soil, and the cleanness from other plants, give vigor to this bean, and make one-third of the whole course meliorating, to two-thirds of exhausting crops. The same moisture also nourishes the oats, and prevents that crop exhausting so much, as in dryer regions—and also by its greater bulk of straw, furnishing more materials for manure. These circumstances render this rotation, severe and barbarous as it is, less exhausting (or more improving, if much attention is paid to manuring,) than the ordinary three-shift rotation. Except in the chance-made addition of the spontaneous bean crop, this rotation offends against every principle and rule which ought to govern.

The *three-shift* rotation was the next step in the supposed march of agricultural improvement, and even yet is that which many remaining two-shift or no-shift cultivators aspire to reach, as the limit of their farming and improving ambition, and their *ne plus ultra* of mild cultivation. This was—

Ist year, corn—
2nd year, wheat, and afterwards the spontaneous grass and weeds grazed—
3rd " pasture, closely grazed.

The severity of the second year was generally moderated on the poorer parts, by the wheat being there necessarily omitted—which of course gave to those parts two years rest from tillage, in three; and, while the wheat was growing, a cessation from grazing also. With very few exceptions, such was the general system of the best cultivated farms in lower Virginia, when Taylor wrote; and it is on this kind of three-shift rotation that his denunciations were so deservedly cast. This rotation violates every sound principle and rule, and certainly deserved to be treated without mercy; but many have continued to denounce the three-shift rotation, even when rendered comparatively mild, as if the evil was in the *number three*, and not in circumstances more important than the mere number of shifts.

But taken in the aspect above described, and which was the best then that was exhibited, the three-shift rotation had no merit whatever. It had no other than fibrous rooted plants; no other than narrow-leaved crops; no root, leguminous, or even grass crop—for the close grazing merely served to prevent the scanty weeds and grass from growing; and while every year's crop was exhausting, the system furnished but small resources and materials for manure. For the grazing animals were as many as the land could keep alive, and scarcely any were fattened (by grazing alone,) for home consumption or market—and their support served to diminish, instead of adding to, the fattening or manuring of the land. At that time it would have been difficult for a reading farmer to *comprehend* this undoubtedly sound maxim of English writers, "the more cattle kept, the more grain or other crops produced." But the English farmer *keeps* no animal except for the profit it will yield; and all that are so kept, give their rich and abundant products of manure, as an additional profit to the soil. But when a stock of cattle, sheep, and hogs, can barely make out to keep alive through the year, and never fatten, except by stall and grain feeding, then keeping them certainly yields no clear profit to their owner, and their close grazing of the fields takes away more of fertilizing materials, than their dung can possibly replace. An English or French farmer would be no less at a loss to comprehend the object (or even to believe in such a general practice,) of keeping a large stock of animals from which no net profit was obtained, or even hoped for; and he would justly think that it would not be more absurd for a farmer to tend a crop of grain, and then leave it to rot on the field, than to give all his grass through summer to animals, and then lose the flesh so acquired, by starvation through the winter. Indeed, the general cattle management of this country would scarcely be believed in any good grazing or farming region. On the farms under the usual three-shift rotation, say of 400 acres of arable land, there would be from 40 to 60 head of grazing cattle, which furnished annually to the owner, at most, about as much milk and butter as two well kept cows might supply—one or two passable beeves, with the aid of grain feeding, a few poor calves for veal—and a pretty large supply of *hides* from deaths by starvation in the spring. There were hogs enough to furnish the year's supply of bacon; but only by means of

grain feeding, which alone was admitted to cost nearly or quite as much as the market price of the meat. A flock of poor sheep were on some farms also, of which, before shearing time, half the wool of many was hanging on the briers, and the remaining fleeces filled with burs. This sort of grazing system accompanied the old three-shift rotation; and inveterate as were old habits, and patient as we are of long-borne grievances, this evil was so great, that none could deny but that the mere expense of the dividing fences, necessary to keep the cattle from the fields of grain, cost more than all the returns from the grazing animals.

The *four-shift* rotation, recommended and practiced by Col. Taylor, was—

1st year, corn—
2nd " wheat, and clover sown—or if too poor for wheat, left at rest, and not grazed—
3rd " clover, (or weeds) not mown or grazed--
4th " clover, not mown or grazed.

This rotation, as before stated, was the first introduction of manuring fields by their own vegetable cover, and this practice, and the admission of the opinions on which the new practice was founded, was a prodigious step towards agricultural improvement. It is true that even this rotation is opposed to the rules of good husbandry in most respects. But the giving of two and a half years out of four for vegetables to grow, that were to die and decay on, and be finally ploughed into the land, was a feature that compensated for every fault, and made the rotation decidedly meliorating, if on land capable of being enriched by the mere application of vegetable matters.

In the first of these numbers, it was stated incidentally to other matters why this rotation became of less benefit and more objectionable, in proportion to the time, and to the effect with which it operated; and if it improved the productive power of any land, that it also greatly increased the labors of tillage, and the destruction of products, by increasing weeds and noxious insects. In consequence of this objection, very few disciples of the great introducer of and advocate for this rotation have continued long to pursue it strictly.

The *four-shift* and *clover fallow rotation* differs widely from that of Col. Taylor. This has been, and I believe still is pursued with great success by Hill Carter, of Shirley, John A. Selden, of Westover, and has been on some other of the best lands on James River, where it has since, in other hands, been either neglected or abandoned, for some modification of the three-shift rotation. This four-shift system is

1st year, corn—
2nd " wheat, and clover sown, and not grazed—
3rd " clover, not grazed, and ploughed in deeply in August and September, and the field sown in wheat—
4th " wheat, to be followed by corn, in recommencing the rotation next year.

A sufficient standing pasture was kept on other land. Mr. Carter, for a considerable length of time, substituted oats for corn in the first year.

The farmers above named, (whose accounts of their systems and their products were reported at length in vol. i., Far. Reg.,) and others also, undoubtedly made great crops, and great improvement of land, under this very severe rotation. But those results were due more to the excellence of their general management that to their rotation. None but admirable executive farmers can possibly overcome the great difficulties which accompany this rotation. He who, in our dry climate, on a stiff or even medium soil, can plough every August and September one-fourth of all his arable surface, to the depth of 8 or 10 inches, and turn in and cover effectually a heavy coat of clover—and this without failing in any year—shows thereby alone his ability to execute the most arduous undertakings, and to *do well* every thing which he may make a part of his general plan of operations. This rotation, in such hands as have directed it, has some admirable features; but it must be executed in the most perfect manner, or these best features are lost, and there will remain only the great evil of three fibrous-rooted, narrow-leaved, and exhausting grain crops, in succession.

The great merit of the four-shift rotation, in general, and considering it as embracing both of these very different varieties, is its easy adaptation to more mild or more severe cultivation, without any different arrangement or number of fields. Thus, Taylor's rotation may be rendered still milder (as is needed on the poorest lands,) by omitting the wheat crop; and as the land improves, the richer spots may be thrown under the more severe cultivation of the other four-shift system, as practised by Mr. Carter or Mr. Selden. But, in any form, the rotation still remains objectionable, for the succession of grain crops, (if there are even two in the course,) as well as for other things, in one or the other variety, which have been already stated.

Every rotation yet known in Virginia is more or less objectionable upon one or more of the following grounds:

The adoption of certain usual crops, without regard to the various qualities, and the wants of the soils, or even to the demand of the market. Thus every farmer is sure to make corn and wheat (or oats,) his principal, if not his only crops. Thus the fields are deprived universally of the most improving culture of roots, which dip into and draw from the soil deeply—and of pea-crops, which feed on the air, and give the product to the soil as manure—and of all annual green manure crops, which would cleanse the soil by their getting in, their growth, and ploughing under, as well as manure it; and the store cattle and hogs suffer for the want of roots and other succulent food, and those which are necessarily well fed, consume grain almost exclusively. Besides these and other objections, which any good practical farmer, or sound theorist, would make, I would further object to the great defect of the preparatory crop not serving to destroy the weeds which will obstruct, and the insects which will prey on, the succeeding crop. Two great exceptions to this last general fault are presented when wheat follows clover, or tobacco, both of which are plants of the broad-leaved kind, unlike in all respects to the succeeding crop, and of such unlike conditions also, that it may be presumed that the growth of either has served well to destroy many of both the weeds and insect depredators, which are injurious to wheat. Accordingly, these two crops are the best forerunners of wheat; which after them always is an excellent crop for the land and the season.

Every well informed farmer will agree to the importance of there being more melioratiug crops introduced in our rotations—more grass, peas, roots, and broad-leaved vine crops. But the objection always is to making crops for which there is no sale, or market demand. But suppose there is no direct sale and money profit made from hay or roots—they will yield as much profit by being used to feed and fatten *(not merely to keep alive)* the necessary farm stock, and thus allow to be sold the corn and other grain which would be otherwise consumed by the animals, with less relish, and less benefit.

While roots are totally wanting in our rotations, one important office is left unfilled, that is, the deep-piercing of the soil and thorough opening of it by tap-rooted and tuberous rooted plants. Another thing wanting, is the ploughing under of pea or other annual green crops, to cleanse, as well as to manure the soil. These properly introduced, and the grain crops separated by green crops, would produce rotations far more improving to the land than any yet known, and probably as much better for early annual income as for improvement of the land—the farmer's best capital.

It is greatly to be feared, however, that root culture on a large scale, forming a part of the general rotation of crops, cannot be profitably adopted in this country, owing perhaps to the defect of our climate. Turnip culture was the great means of improving agriculture in England; and, as there united with sheep and cattle fattening, the turnip crop is the most enriching of the rotation. But here, turnips are considered among the most exhausting of cultivated crops; and besides, too uncertain in product, and of too little profit, to be admitted into a general or regular rotation of crops. But perhaps the experiment may not yet have been fully tried; and even if turnips are unsuitable, perhaps some other kind of roots more suited to a warm and dry climate, may serve the purposes of turnips.

We have in this country a class of crops which are not known in European rotations, or scarcely in agriculture, and which may come in admirably as part of a rotation, and serve the ends of all the three rules. These are annual vines, such as pumpkins, squashes, cimblings, and melons. These plants, though requiring rich soil, must by their broad leaves draw the most of their support from the air. By the early tillage which they require, and the thick and smothering cover which they afterwards afford, they serve to cleanse the land; and on this account, and also by the total change of kind, and of circumstances, they must be good precursors for the narrow leaved grain crops. But these are mere theoretical views, as these valuable crops have been heretofore cultivated almost as sparingly, and with as little attention to their cost and profits, as has been done in Virginia in regard to root crops. E. R.

FINE WOOLED SHEEP.

From the Farmer's Monthly Visitor.

Hopkinton, March 1, 1839.

Dear Sir:—I have seen in the last number of the Farmer's Monthly Visitor, page seventh, an account of the purchase and stocking with sheep of the Burleigh farm in Dorchester by President Lord of Dartmouth college. In the account given, a very unfavorable allusion is made to the fine Merino and Saxony sheep, as requiring the utmost care and the most tender treatment. I also find in the second number of the same work, page eighteenth, a declaration that the native New England sheep are more hardy and less liable to disease, than the finer breeds; and that an opinion is suggested that they may be kept at as good advantage. I am not prepared to say that the native sheep of this country may not be raised by the farmer at a profit, if they can be found; but I know of none that are not more or less mixed with the finer kinds. I greatly misjudge, if the advantage is not very much in favor of finer breeds, and the finer the greater the profit. I am also extremely deceived if they are not kept through the year at as little expense as the natives, and at much less trouble. Native sheep are uniformly tall, long, lank, and coarse wooled; untame, great racers and expert jumpers; vexing their owners, and frequently the whole neighborhood by visiting every field and enclosure they wish. The Saxony and Merino sheep, which produce the finest wool that is known in this or any other country, are shorter legged than the native breed, more round and plump in every part of them, and easily fattened. They are more quiet and peaceable in their disposition, and with ordinary care of fences, seldom if ever stray from the pasture where they are put. They afford mutton equal to any other kind; their quarters being round and full, mild, tender, and fine flavored. They are the smallest sheep I have ever known. This I consider an advantage rather than a disadvantage. They are not like our oxen required to perform labor. They are kept for their flesh and fleece only, and from long observation I am convinced that it requires the same quantity and quality of food to make a hundred pounds of mutton, or a hundred pounds of wool, whether it be given to small or large sheep.

As regards diseases of fine sheep, I know of none that may not be visited upon the natives, which are equally liable when brought together in as large flocks. In my own flock I have never known any contagious disease, if I may except a flock of fine sheep of one hundred and twenty-one, which I took in the fall of 1827 for the term of one year. When I took this flock, they were all diseased and lame with the foot-rot. I found them extremely poor, and some of them unable to walk, and feeding upon their knees. During the year I lost nine of them by poverty and disease, and two by casuality. At the expiration of the term I divided equally with the other owner one hundred and ten old ones, and at the thirds, thirty six lambs, all perfectly healthy and in good order. With this exception, I have never known any contagious disease to trouble any sheep I have had the care of. I seldom lose one in any way, and am equally fortunate with my lambs, when not troubled by foxes. At the yeaning season of 1837, one fox killed from my flock, and carried to her young, seventeen lambs in four days and nights. I had a number killed at other times, and my loss in lambs by foxes that season was from fifty to sixty dollars.

I am one of those who believe things should be told as they are. I should feel hurt were I to lead any one astray from his interest by any thing

that I have said, and as some proof of the truth of the foregoing, I here give an account of the income of my own flock. My average number of sheep at the shearing season in eight years, from 1831 to 1838 inclusive, has been two hundred and forty-one. I have received in cash for sheep and wool sold from my flock during that time, four thousand, five hundred eighty-four dollars and seven cents; giving a yearly income of five hundred seventy-three dollars and one cent, or at the rate of two dollars thirty seven cents and a fraction a head, a year.

When it is considered that six small fine sheep may be kept on the same food that would be required to keep five large coarse ones, which I have no doubt is short of a reasonable estimate, a preference for the fine flocks will be more apparent.

I shall be likely to retain my partiality for fine sheep till some one gives an account of a more profitable flock of coarse ones of an equal number.

STEPHEN SIBLEY.

ARTIFICIAL INCUBATION. THE ECCALEOBION.

A highly curious and interesting exhibition, especially to the physiologist, is now open at Pall Mall, opposite the Opera Colonade, called the Eccaleobion, a contrivance far hatching eggs by artificial heat. It differs from the Egyptian method of artificial incubation by means of *mammals*, or ovens heated immediately by fire which was tried in Paris by De Reaumur; and in London by Mr. Mowbray; and also from the more recent attempt at the Egyptian Hall by means of steam. In what way the heat of the Eccaleobion is produced, we are not informed; probably it is by hot water: certainly the operation is simple and effective, as abundant living proofs daily testify.

In an oblong wooden case, about nine feet in length, and three in width and depth, entirely isolated, and divided into eight compartments, each closed by a glazed door darkened, the eggs are placed on cloth, without any covering; here they remain for twenty-one days, the period of incubation; at the expiration of which time, the chick liberates itself, and the next day is running about and pecking its food as lively as if it had the hen's wings to shelter it. The Eccaleobion is capable of containing upwards of two thousand eggs, and of hatching about a hundred daily; and though some failures occur from natural causes, the machine, unlike the parent bird, never addles the egg.

It is always contrived that one compartment shall exhibit the last stage of incubation; and this being open, the visiter may not only hear the faint chirp of the imprisoned chick, but watch its attacks on its oval cell till having broken the shell all round, it bursts the integuments and liberates itself. At first emerging into this new state of existence, the light and the human eyes gazing on the little chick, together with its extreme weakness, make it appear as if it would fain retire into its confinement again; it staggers, closes its eyes, and falls down in an apparent exhausted state, but soon revives, though but for a short time; as soon as it can take food, however, it gains strength rapidly. In the last stage of incubation, the egg may be held, in the hand, or placed in a lady's bosom; where, if any fair visiter be so minded, the chick may come to light.

In the case fitted with lenses, placed before eggs in different stages of incubation, lighted by gas, the appearances through the shell may be observed; and on a table are place the contents of several eggs at successive periods of incubation, showing the formation of the embryo, from the first day (as seen under the microscope) to the complete bird, coiled up in its oval form; to trace the gradual developement of the eyes, the bill and the cranium, the heart and circulating system, the feet, feathers, &c. is exceedingly interesting.

The fledgelings are placed in partitions and supplied with food, and the room rings with their chirping.

The Eccaleobion process is of course applicable to eggs of every species of bird, but none others than those of the common gallinaceous fowl have been reared: parties bringing the eggs of other birds, however, can have them hatched by the machine, as the same temperature (about 98 degress of Fahrenheit,) is applicable to all, from the wren to the eagle. The introduction of the Eccaleobion into general use, will supply abundance of fowls for the table, at a very cheap rate, and with little trouble: the machinery of the Eccaleobion is also applicable to a variety of scientific purposes, where an even and prevading temperature is required; as it may be regulated at pleasure up to 300 degrees of Fahrenheit. We gather this information from a very intelligent pamphlet, bearing the title of the exhibition, by William Bucknell—the inventor we suppose—that is sold in the room.—*Eng. Paper.*

THE BROWSING OF SHEEP, DURING THE CONTINUANCE OF SNOW.

[The following article may not aid the practice of many of the readers of the Farmers' Register. Nevertheless, it is interesting even as a practice suited to peculiar circumstances, and also as showing the nutriment furnished by the branches of trees alone, for the support of sheep.—ED. F. R.]

From the Farmer's Monthly Visitor.

Two of the most successful wool growers within the knowledge of the writer are Stephen Sibley and Joseph Barnard, Esquires, living in the immediate neighborhood of each other in the adjoining town of Hopkinton. These gentlemen, from the choice flocks which they possessed, have been able to sell their wool at their own doors at high prices when the ordinary wool could hardly be disposed of at any price. Mr. Sibley has a mountain pasture extending over the back of old Kearsarge which he has recently cleared: from ten acres of it the last season he had a fine crop of rye, which he carted fifteen miles in the straw to his own homestead.

Below is presented a letter from Mr. Sibley, which we find in a Maine agricultural paper published three years ago, and in which he describes at length his method of feeding sheep on browse in the winter. We have no recollection of before having seen this letter, although we have had a similar description from the mouth of Mr. Sibley.

This gentleman may be relied on as a safe adviser, because he has had many years successful practice in the rearing and keeping of sheep. His system of browsing, we believe, is continued at the present time. His letter contains valuable hints to wool growers:

Hopkinton, N. H. Oct. 25. 1835.

My dear sir.—On the return of your uncle I was told you wished to know my method of browsing sheep. * * * As soon as the ground is covered with snow I browse my sheep daily. I go to the woods and make one or more temporary cribs by placing two poles parallel 18 or 24 inches apart upon two handfuls of brush or billets of wood. Between the poles I place or set my boughs of hemlock or hard pine—(probably spruce, fir, or cedar will do as well)—thrusting the but ends into the snow and having them lean the same way. I extend my cribs till they well accomodate the number of sheep I wish to feed. I then tread down the snow about the cribs so that sheep can easily pass by those that have reached the browse and are feeding. I then turn my flock to the cribs, and my work is done. In the latter part of the winter, when the snow is sufficiently hard to bear up the sheep, I thrust the boughs, when cut off, into the stiff snow, in rows without poles, but so close together as to prevent the sheep passing through them.

Three winters ago when I began to browse my sheep, I cut my browse and threw it about at random; but I soon found my sheep too nice to feed in that slovenly manner. They would run over it and leave it. I took the hint of arranging in the way I have mentioned, from nature, for I have observed where broughs pendent from the trees were sufficiently low to be reached by the sheep, they would go directly to them and feed more freely than in any other way. Sheep are not pleased with having their food touched even by the hand of man.

The advantage of browsing sheep is no longer doubted here. It gives them exercise, fresh air and green food during the whole winter. I drive my sheep in flocks of from fifty to one hundred nearly a mile every day, unless the weather is very tempestuous, and they heed cold weather as much as the deer or moose that range about the White Mountains.

A farmer in this town wintered about seventy-five sheep wholly on browse and a gill of corn a day to each. His flock were not at the barn during the winter, and they come out of the woods in the spring in fine order. He was fortunate with his lambs that season, and the following fall sold his wethers to the butcher for four dollars a head. I believe he had a slight covering to protect his sheep from storms. I give no grain of any kind to my sheep, except to my lambs the first winter, or to a few old ones that may be feeble; to these I give at the rate of a quart daily to twenty-five. To my breeding ewes I give half a gill a day for three or four weeks before they yean. I keep my stalls dry and airy, and daily brush every straw they leave from their cribs. For the last three winters I have wintered 274, 367, and 275, and have lost but two during the three winters. My breeding ewes last winter numbered 127—of which seven proved barren. I had two lambs killed by a fox—two died by taking cold after castration—one from being trod upon when very young, and one came too feeble to live, and died—loss in all, six. I have since disposed of five, and my lambs now number 109; and a more plump, healthy and beautiful flock I think cannot be found in New England.

I have lately sold 68 of my old sheep, and my whole flock now numbers 311. I have brought up my flock mostly from Merino ewes, and they are now from full blood Saxony to those made nearly so by breeding from the finest Saxony bucks for nine years. My fleeces averaged 2 lbs. 6 oz. and sold at 75 cents. My store sheep sell from 3 to 10 dollars a head. Yours, &c.

STEPHEN SIBLEY.

P. S. Since the foregoing article was put in type, Mr. Barnard has exhibited at our office a beautiful silver medal of the New York American Institute with this inscription on one side :—

"*Awarded to Barnard and Sibley for the best American Wool*, 1838."

The other side contains the arms of the state of New York, surmounted with the words "*American Institute.*"

It is much to the credit of Messrs. Barnard and Sibley, and honorable to the granite state, that these gentlemen should have exceeded the wool-growers of any other state in the quality of their wool; that they should give to our state the name of producing, at the extensive exhibition of the New York American Institute—which has become an Institute for the whole United States—"*the best American wool.*"

During the year 1837, Mr. Sibley disposed of about one hundred and fifty of his fine wooled sheep for exportation to Buenos Ayres in South America, *some of which were sold after their arrival as high as seventy dollars each.* These sheep were about 7-8 Saxony blood, crossed on fine wooled Merino: they were sold at a time of great depression in the price of sheep in June, when the prospect for wool was poor indeed. Mr. S. obtained five and a half dollars for the unsheared, and four dollars each for the sheared sheep. His finest wool that year was sold at fifty cents the pound.

DEEP PLANTING.

From the Boston Cultivator.

A patron of ours informed us a few weeks since, that while taking his fodder, he discovered a great difference in appearance between two pieces of corn, which were planted at the same time, and in the same kind of soil. The fodder on one piece of ground dried up so fast that he could scarcely get through with stripping it before it was entirely burnt up, to use the common phrase. On going to the other piece, he found it green to the ground, and in good plight for stripping. He was struck with the difference in the two lots of corn; and on reflection recollected that on getting ready to plant his corn in the spring, he ran a furrow with a large shovel or bar-share plough, after which he followed with a small plough called a bull-tongue, running it pretty deep in the same furrow, till he got perhaps half over the piece, when he concluded to plant the balance in the single furrow, and dis-

continued the use of the bull tongue. The result was, that the part planted deep in the opening made by the small plough, where the larger one had previously been run, produced a third more fodder, and of a better quality than that planted in the shallow mark made by the large plough alone; besides the great difference there must be in the weight of the corn, the latter drying up too fast of course to make a proper article for bread. This should be remembered by farmers, and the evil of shallow planting avoided, especially since all seem to think the seasons are becoming shorter, and much dryer than formerly.

PETITION OF THE AGRICULTURAL SOCIETY OF ALBEMARLE FOR THE ESTABLISHMENT OF A BOARD OF AGRICULTURE.

August 5th, 1839.

At an adjourned meeting of the Agricultural Society of Albemarle, James Barbour, sen'r., Wm. C. Rives and Frank Carr, were appointed a committee to draft a memorial to the legislature of Virginia, urging upon that body the establishment of a Board of Agriculture for the state, and to circulate said memorial, thereby soliciting the co-operation of those friendly to its object.

Teste, FRANK CARR, *Secretary A. S. A.*

TO THE LEGISLATURE OF VIRGINIA.

The Agricultural Society of Albemarle was formed some twenty years past, by some of the wisest and most patriotic citizens of the commonwealth; among whom were their first president, the late James Madison, and his distinguished compatriot and friend, the late Thomas Jefferson. Associated under such auspices, and having in view an object of such general and high importance, it presents itself before the legislature to invoke its fostering aid in behalf of agriculture.

The views of the society, were there a reasonable hope of success, would extend to the establishment of a professorship of agriculture—a board of agriculture, and an experimental farm. Taught moderation, however, by the ill success heretofore attending their efforts before the legislature, they content themselves with asking now for the creation of the board—the members to be appointed by the governer, and to be selected in equal numbers from the four great divisions of the state. The number at the beginning to be twelve—the compensation to be the same as that allowed to the members of the General Assembly, with an allowance for the contingent expenses of a clerk, printing, &c. Their sessions would be limited to a few days, and the amount of the cost of such sessions could not exceed a thousand dollars. And to what purpose could a sum of that amount be appropriated with a prospect of a fairer return? It is about equal to the expenses of one day's setting of the legislature. The Society will not permit itself to believe that an elaborate enumeration of the benefits of the measure they recommend need be made to the legislature, many of whom (and it is fervently wished their number were greater) are agriculturists. Let a few of the more prominent considerations in its favor suffice: It is known to the legislature that such an establishment exist in every elightened government in Europe; where the welfare of the people actuates their policy—but particularly in England, whose good fortune it has been to take the lead in cherishing the arts and sciences.—And it is an important truth that ought to be deeply impressed on the mind of every legislator, that agriculture has advanced hand in hand with such establishments—that while the small outgoings to sustain them have returned in benefits an hundred fold, the countless millions squandered in schemes of lawless ambition and in ruinous wars have left no monuments save of the folly and wickedness of rulers and of the sufferings of mankind. And it is submitted to the sober reflection of the legislature whether the dedication of a small portion of their time to the important interests of agriculture, might not be as profitable as when spent in the endless political strifes that exercise so baneful an influence on the quiet and happiness of society.

A board of agriculture, composed of twelve of the most intelligent cultivators, could not fail to concentrate a great mass of agricultural information now confined to a few, but then to become the property of all. It is not merely the knowledge we now have, but we may confidently count on its continual increase which could not fail to ensue by a communication with each other. The errors into which they may have fallen, and of consequence, prevail in the regions they represent, by this communion would be detected and exposed; and being a rallying point which would attract to it the affections of all who take an interest in the subject, all would contribute to the usefulness of the establishment, by communicating whatever was calculated to further the objects of its creation. Information would be sought by such a board, by carrying on correspondence with similar institutions, whether in this country or in other quarters of the globe. With these funds of intelligence the board might prepare a code of agriculture, combining all the now well established principles of husbandry, and to be progressively improved by successive discoveries. Nothing has been productive of more mischievous consequences than pursuing, in the absence of a better guide, treatises on agriculture adapted to different climates and different circumstances—as pernicious as the acts of a foreign legislature, ignorant of the wants and the condition of the distant people for whom they legislate.

The society will not resort to the threadbare and disgusting theme of exhausted fields, dilapidated houses, and an impoverished and emigrating population—for it is not to your sympathy they would appeal, but to your justice—It is not a favor they ask, but a right they demand. The cultivators of the earth pay directly into the treasury nine-tenths of the revenue. Has a solitary farthing been expended directly in their favor, although agriculture is the most important, and at the same time, from its complication, the most difficult to acquire among the pursuits of life? They have seen, and without regret, portions of their hard earnings expended on objects proper in themselves, but when compared with the improvement of husbandry, insignificant. They now ask that something may be done for the very foundation on which the prosperity of the state reposes.

Small as may be the dispensation now required, compared with what they have a right to demand, they console themselves with a hope that when

the advantages of a board of agriculture shall be developed, the legislature will continue to manifest its patriotic solicitude by additional aids to this great and permanent interest; and in conclusion they suggest, that the condition of the cultivation of the earth may be assumed as a fair barometer of that of the state. When prosecuted successfully, peace and plenty prevail—when unsuccessfully, disastrous effects smite every portion of the social body. Nor should it escape the representatives of a free people, that it is the intelligent cultivator to whom liberty, in any crisis of difficulty, refers as her safest champion. All which is respectfully submitted.

ROTTEN LIMESTONE SOILS OF ALABAMA.

To the Editor of the Farmers' Register.

In my short communication found in the August number of the Register, (page 499,) I must explain what you have corrected. It was written in a moment of haste, and not sufficiently explicit. When I said that "to talk of any earth being amongst the *rotten limestone* would be absurd," the idea I intended to communicate was, that *the pile of rotten limestone was so far raised above the surrounding earth, that none could have been put amongst it.* It was a mass of *rotten limestone entirely.* Throughout this state, and equally throughout Georgia, where this matter abounds, few individuals can be persuaded to place any confidence in its valuable effects on vegetation, believing that it possesses no *nutritive qualities.* The facts presented appeared to me so evident a contradiction of this opinion, and such a positive proof that calcareous matter in some forms must in some way or other furnish a pabulum or food for plants that I viewed the facts as worth notice. The vegetation of plants is not more rapid or luxuriant in the bottom lands of the Alabama or Tombigbee than on the *shell banks* beforementioned, and I cannot think that the small proportion of alluvial soil could satisfactorily account for it, but that credit must be given to the calcareous matter for furnishing nutrition in some way or other. I would also remark that the vegetation in the heap of *rotten limestone* continues to grow with singular luxuriance, although we have had in this section of the state for some time back a most destructive drought. *Cotton* is cutting short rapidly, on every kind of land except the rotten limestone or *cane brake* lands.

AGRICOLA.

Southern Alabama.

WATERING CATTLE IN WINTER.

From The Farmer's Cabinet.

Perhaps it would excite the surprise of many of our readers, should we assert that cattle generally suffer more from thirst in winter, than during the heat of summer. Yet there is strong reason to believe that this is to a great extent the case. Cattle whose winter food consists entirely of hay, straw, and other dry materials, need a plentiful and frequent supply of pure fresh water. This many do not obtain, as nearly all running streams are covered with ice, and cattle are obliged to wander a considerable distance from the yard to the watering place, through deep snows or over a slippery path, exposed to the annoyance of dogs, or to be gored by other cattle, and rather than endure this, they often suffer much from a want of water. It has been ascertained that a bullock, who has water at command, will drink it eight times a day. It should always therefore be of easy access to cattle at all times; and not on a distant part of the farm, or in the open road, so that in order that your cattle may help themselves to it, you are obliged to leave your gate open, or barn-yard bars down, and thus your yard is thronged with vagrant colts and other ill-bred animals, who take possession of whatever fodder they can lay their mouths upon, and pay no regard to the rights of *meum* and *tuum.* Dr. Anderson says that he knew a man who became very rich by being *great* in *little* matters, that is, attending carefully to things which other men consider of too little consequence to claim their notice; and this man always made it a point to see that his cattle, particularly his milch cows, should have a constant supply of pure water.

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

By GEORGE D. ARMSTRONG, Prof. of Nat. Philosophy, and Chemistry, in Washington College, Va.

[Continued from page 469, No. 8.]

CHAP. XXI.

DISTRIBUTION OF PLANTS. EFFECT OF DIFFERENCES IN CLIMATE. EFFECT OF DIFFERENCES IN SOIL. BOTANIC NOMENCLATURE FOR SOILS.

In examining the vegetable covering which is every where spread over the surface of our earth, we cannot but notice the fact, that the plants of which it is composed differ much in different countries. This difference appears to result principally (if we leave out of account the influence of man) from two causes; viz., differences in climate and differences in soil.

Temperature has obviously a great influence on vegetation. It is a well known fact, that the plants of tropical countries, such as the tropical palms, cannot be made to flourish even in temperate regions, much less in those which border on the polar circles; and on the other hand, those which are indigenous to temperate climates, such as wheat and rye, will not flourish within the tropics. In considering the temperature of a country in relation to vegetation, we should attend not only to its mean temperature, but to the extremes of heat and cold to which it is subject, and also to the liability to sudden changes, more especially in the spring and fall; in the spring, because plants are then putting forth their leaves, and those organs are then peculiarly tender; in the autumn, because then plants are ripening their seed and are very easily injured.

The effect of differences in climate is not so great in the case of some plants as in that of others. The results of many observations respecting this matter are, 1st, endogens, such as the palms, which are destitute of a distinct bark, are much more sensibly affected by sudden changes of temperature than exogens, such as the oak; 2nd, plants of a dry nature, resist cold much better than such as are watery, and indeed all plants resist cold better in dry winters, than in moist ones; 3rd, as a general thing, trees which lose their leaves during the winter resist cold better than such as retain them, and of those which retain their leaves, resinous trees, better than those which are not so; 4th, herbs, the roots of which are perennial, all resist better than those whose stalks and leaves are persistent; 5th, annuals which flower late, and whose seed lie dormant in the soil till the succeeding spring, stand the winter better than those which flower early, and whose seed drop and germinate before winter.

The causes which have most influence in determining the climate of a country are, distance from the equator, elevation above the level of the sea, and the nature of the surface. Without entering into a philosophical examination of the manner in which climate is affected by each of these causes, it may be worth our while to attend to a few facts respecting the extent to which each of them does affect climate, in order to ascertain their effect on vegetation.

From a comparison of a great number of observations made by Humbolt and others, in different parts of the world, it appears that a difference in latitude of one degree, causes a difference in the mean temperature of 1° Fahr.; and that a difference in elevation above the level of the sea of 400 feet, produces about the same effect. "Mountains 1000 fathoms or 6394 English feet in height, in 46° north or south latitude, have the mean temperature of Lapland; mountains of the same height between the tropics enjoy the temperature of Sicily; and the lofty summits of the Andes, even where situated directly under the equator, are covered with snow as eternal as that of the north pole." "At the foot of Mount Ararat," says Tournaport, "I met with plants peculiar to Armenia; above these with plants which are common in France; at a still greater height I found myself surrounded with such as grow in Sweden; and at the summit with such as vegetate only in polar regions."

The nature of the surface of a country also affects its climate. The presence of high mountains always renders a country colder than it would otherwise be; proximity to the sea renders a country cooler in the summer and warmer in the winter; a country whose surface dips towards the south is much warmer than one in the same latitude whose surface dips towards the north. It is a fact which has long been known that countries in America and Asia, are much colder than those of Europe in the same latitude. American plants vegetating at 42° north latitude, will vegetate at 52° in Europe. The low temperature of America as compared with that of Europe, is owing principally to the existence of immense tracts of wood land and vast marshes in the former, which are entirely wanting in the latter. The low temperature of many parts of Asia is owing to their great elevation above the level of the sea; almost the whole of central Asia is described by travellers as a vast plane, elevated many hundred feet above the level of the sea. Africa is much hotter within the tropics, than the corresponding parts of South America, because in the latter the temperature is lowered by the presence of immense chains of mountains, whilst in the former it is increased by the hot and burning sands which cover so large a portion of its surface.

The influence of elevation upon the climate of a country, accounts for the great variety of plants which are found indigenous to mountain districts. It has been laid down as a botanical axiom, that the more diversified the surface of any country is, the greater will be the variety of plants found growing in it.

From the remarks which have been made respecting the influence of climate upon vegetation, it must not be inferred, that the same plants will always be found growing in countries which resemble each other in that respect; for whilst two countries may be equally well adapted to the growth of particular plants, there may be causes which will effectually prevent those which are natives of one country from becoming spread throughout the other. Of such a character are, the existence of sandy deserts, so extensive that seed cannot be carried across them by any natural means; seas so vast that seed cannot be drifted in safety from one shore to the other; and long and lofty chains of mountains. To these causes it is that we must trace the fact that countries resembling each other in climate and soil, do not always produce the same plants. "Thus in certain parts of North America, which closely resemble those of Europe, not a single European plant is to be found. The same remark will apply to New Holland, the Cape of Good Hope, Senegal, and other countries, as compared with other countries similarly situated as to their physical circumstances." The separation of Africa and South America, if they ever were united, Humbolt remarks, must have taken place "before the developement of organized beings, since scarcely a single plant of the one country is to be found in a wild state in the other."

The character of the soil as well as the nature of the climate, has a great influence in determining the habitation of plants. This may arise from several causes. Among the more important of these are: 1st. The fact that some plants require certain peculiar substances not common to all soils, in order to perfect their organic structures. Thus silex enters largely into the composition of the bark of the cane, and unless this substance be present in the soil, it will of course be impossible for that plant to perfect its stem; carbonate of soda is a necessary element in the salsola, and in no soil but one furnishing carbonate of soda can the salsola grow. 2nd. The peculiar texture of a soil depends very much, perhaps we might say, entirely, upon the nature of the substances of which it is composed. A silicious soil is always loose and porous, an argillaceous soil is always close and stiff. A loose porous soil it is evident is much better adapted to the healthy growth and rapid propagation of such plants as have large and fleshy roots, or as develope tubers or underground stems, than a close, and stiff one; so that if we should suppose that in the first place, one of this species of plants was equally diffused in all kinds of soil, the whole tendency in the one case

would be to its rapid diffusion, whilst in the other case, it would be to its destruction. 3rd. The action of soil upon the excrementitious matter deposited by plants, will also affect their distribution. As has been remarked in a previous part of this essay, this excrementitious matter differs much in the case of different plants; in some cases possessing an alkaline, in others an acid character. If it be of an acid character, and the soil contains some salefiable base with which that acid may unite, and by which it may be neutralized, such for instance as lime, the action of the soil will be of such a nature as to favor the plant's growth and increase; but if on the other hand the soil already contain an acid, its action, or rather its want of action will be of such a nature as to result in the entire extirpation of the plant. In such ways as these, the nature of the soil, must always have great influence in determining the habitation of plants.

As a thorough knowledge of this matter will admit of some important practical applications, and as I am not aware that any extensive series of observations on this subject has ever been made in this country, I will give a list of those plants which are considered peculiar to particular soils in England, extracted from Loudon's Encyclopædia of Agriculture; substituting for the common English names, those which are common in this country, so far as they are known. Loudon's arrangement of soils is, as clayey, calcareous, sandy, feruginous, peaty, saline, moist or aquatic and dry.

1st. "An argillaceous or clayey soil may be distinguished in most parts of Europe by the growth of the following plants.

Tussilago farfara, (colts-foot.)
Thalictrum flavum, (yellow-flowered meadow rue.)
Potentilla anserina, (tansey chinquefoil.)
" argentea, (silver five-finger.)
Carex, (many species,) (sedge grass.)
Juncus, (many species,) (bullrush.)
Orobus tuberosus, (tuberous bitter-vetch.)
Lotus major, (no common name known.)
" corniculatus, "
Saponaria officinalis, (soap-wort bouncing-bet.)

Of these, the first mentioned, viz. the *Tussilago farfara*, is a certain and universal sign of an argillaceous soil, and is the chief plant found on the alluminous grounds of Brittain, France and Italy.

2nd. Plants indicative of a calcareous soil.

Veronica spicata, (spiked brook lime.)
Gallium pusillum, (little bed-straw.)
Comparula glomerata, (no common name known.)
Prismatocarpus hybridus, "
Phyteuma orbiculare, "
Verbascum lychnitis, (lychnitis mullein.)
Viburnum lantana, (hobble-bush.)
Berberis vulgaris, (barbeny.)
Helianthemum vulgare, (no common name known.)
Anemone pulsatilla, "
Clematis vitalba, (white-veined Virgins bower.)
Onobrychis sativa, (no common name known.)

Of these, the last mentioned is considered the surest indicator of a calcareous soil in England. The first mentioned, viz. the *Veronica spicata*, I am inclined to think is the *Marl Indicator*. At any rate, this much is certain; that the *V. spicata* is a species not described in any American botany to which I have had access, and the specific name *spicata*, would apply to the Marl Indicator, (judging from the engraving given in the Register,) as properly as to any other species of *Veronica;* and moreover the fact that the *V. spicata* indicates the presence of calcareous matter in the soil has been observed in Europe, and lately the same observation has been made respecting the Marl Indicator, which is ascertained to be a species of *Veronica*, in this country. From my own observation, I would place among the foremost in the list of plants indicating calcareous soil, one which Loudon has not mentioned, the *Lithospermum officimale*, (stone seed or Gromwell.) This is a plant very abundant in all the lime-stone portions of the valley, and I never have seen it but once in Eastern Virginia, and that was in the county of Prince Edward, on a narrow vein of a peculiar species of marl, the only calcareous soil in all that section of country. If it indicates the presence of calcareous matter in the soil, it will do so, not by growing in a stream which in some part of its course has flowed through a marl bed, but by growing on the very spot where the marl exists. The *L. officimale* grows to the height of from 6 to 12 inches, is a tough looking hairy plant, has its leaves situated in pairs on opposite sides of its stem, blossoms very early in the season, continues in blossom 5 or 6 weeks, and bears a bunch of cup-shaped flowers of a peculiar orange-yellow color. Later in the season, four hard shining black seeds may be found in the bottom of each of the persistent calices, and hence its common name of stone-seed. Whether it grows in all calcareous soils I cannot tell, but of this I am quite certain, that it grows in none but soils of that character.

3rd. Plants indicative of a silicious soil.

Veronica triphyllos, (three-leaved speedwell.)
" verna, (summer speedwell.)
Echium italicum, (no common name known.)
Herniaria glabra, "
" hirsuta, "
Silene anglica, (catch-fly.)
Arenaria rubra, (red sand-wort.)
Spergula arvensis, (corn spurry.)
Papaver hybridum, (hybrid poppy.)

Of these, the *Arenaria rubra*, is considered in Europe, the unfailing indicator of a poor sandy soil.

4th. Plants indicative of a ferruginous soil, *i. e.* a soil containing a large portion of oxide of iron.

Rumex acetosa, (horse sorrel.)
" acetosella, (sheep sorrel.)

5th. Plants indicative of a peaty soil.

Vaccinium myrtillus, (myrtle-leaved whortleberry.)
Vaccinium uliginosum, (winter-green whortleberry.)
Oxycoccus palustris, (craneberry or cranberry.)
Spergula subulata, (no common name known.)
Tormentilla officinalis, "

6th. Plants indicative of a saline soil.

Salicornia herbacea, (samphire, glasswort.)
Salsola kali, (saltwort.)
Zostera marina, (Sea-eel-grass.)
Pulmonaria maratima, (sea lungwort.)
Calystegia soldanella, (no common name known)
Illecebrum verticillatum, "
Sison verticillatum, "

Chenopodium maratimum, (salt lamb's quarter.)
Arenaria maratima, (salt sand-wort.)
Atriplex laciniata, (orache.)

7th. Plants indicative of an aquatic or marshy soil.

Caltha palustris, (American cowslip, marsh marygold.)
Hippuris vulgaris, (common mare's tail.)
Pinguicula vulgaris, (butterwort.)
Valeriara dioica, (wild valerian,)
Viola palustris, (marsh violet.)
Samolus valerandi, (brook-weed, water pimpernel.)
Lythrum salicaria, (milk willow-herb.)
Ranunculus lingua, (great spearwort.)
Epilobium tetragonum, (no common name known.)
Thysselium palustre, "
Lycopus europeus, "

8th. Plants indicative of a very dry soil.

Arenaria rubra, (red sandwort.)
Rumex acetosella, (sheep sorrel.)
Thymus serpillum, (mother of thyme.)
Trifolium arvense, (rabbit-foot clover.)
Acynos vulgaris, (no common name known.)

The above is a catalogue of those plants which are considered peculiar to certain kinds of soil in Europe. Some few of them are plants which have never as yet been discovered in this country, others are common here. That some of these plants do indicate peculiarities in the soil in which they grow, seems to have been noticed in very early times, long before botanists had attempted to assign any reason why it should be so, as we may learn from the common names which they bear, and by which they have been known for a time so long "that the memory of man runneth not to the contrary"—for instance, salt-wort, (wort is a word of Saxon origin, and means plant,) sand-wort, marygold, brook-lime, &c. There can be no doubt that these names have been given to them in consequence of their having been observed to grow in such situations as would be pointed out by their names.

A knowledge of the peculiar habits of plants in this respect, will admit of a practical application in two ways.

1st. If we know the nature of the soil which any plant naturally prefers, we may learn the character which we must give to the soil in which we wish to cultivate it, if we would cultivate it to the best advantage. Thus, the *asparagus* is a native of the saline lands along the sea-board, and naturally prefers a soil containing a large portion of salt. It is true that the asparagus will grow, and that to some degree of perfection in a soil containing little or no salt; but, at the same time, it is true, that nothing improves the growth and the flavor of that vegetable more than the free use of salt as a manure, on the ground in which it grows. Our best gardeners have long been aware of this fact, and are in the habit every spring of emptying the old brine from their meat barrels upon their asparagus beds. In no other way can we have a more striking illustration of the adaptation of different plants to different kinds of soil, than is afforded in the operation of brine when thus used; for whilst it will increase the luxuriance of the asparagus, it will kill almost every other plant which may be growing amongst it.

2nd. From a knowledge of the connexion which exists between certain plants and certain soils we may learn the character of any soil by observing the plants which voluntarily spring up and flourish upon it. Hence the use of the veronica spicata or marl indicator in pointing out the presence of calcareous matter in the soil in which it grows. The fact that soils may be distinguished in this way seems to have been noticed by practicable farmers for a long time if we may judge from some of the terms in common use for the purpose of designating soils; thus we speak of whortleberry swamps, cypress swamps, pine barrens, scrub-oak lands, chinquapin lands &c.—And why may not this system, suggested as it has been by the observation of practical men, be carried out, and the different kinds of soil be designated by the character of the vegetable covering which is naturally spread over them, as well as by the substances which enter into their composition; or by the mechanical texture of the soil itself. I would by no means banish from use a chemical or mechanical nomenclature of soils, but simply introduce, what may be called a botanical nomenclature to supply their deficiences. That our present systems have such deficiences every one must be aware. It is truly remarked in the 'Essay on Calcareous Manures' "that," nothing is more wanting in the science of agriculture, then a correct nomenclature of soils, by which the characters might be learned from the names, and nothing has hitherto seemed less attainable. The modes of classing and naming soils, used by scientific authors, are not only different and opposed to each other; but each of them is quite unfit to serve the purpose intended."

A system of nomenclature for soils, based upon the character of their natural vegetable productions, would seem to be a far more natural one for agricultural purposes, than one based upon their chemical composition or mechanical texture. The practical agriculturist wishes to know the nature of a soil, not for the purpose of using its elements for any chemical or mechanical operation, but in order that he may learn what will be its action on vegetation, and any information respecting its chemical or mechanical composition is of use, no further than as it throws light upon this matter. In the character of the plants which spontaneously spring up and thrive upon any portion of land, he has precisely this kind of information embodied in a palpable form by the hand of nature herself. I know that there are objections to this system, and not the least of these, is the uncertainty or entire want of common names for most plants, accompanied as it is with an utter want of a knowledge of systematic botany. But then there are still greater and more insuperable objections to any other system which has yet been proposed;—And perhaps, upon examination, the difficulty in the way of the adoption of a botanical nomenclature, will not be found to be so great as it would at first sight appear.

Among plants which might be used for this purpose are:

The Whortleberry—*Vaccineum*
Dewberry—*Rubus trivialis*
Mullein—*Verbascum thapsus*
Sorrel—*Rumex acetosa*
Pine—*Pinus*
Scrub-oak—*Quercus ilicifolia*
Broom grass—*Bromus pubescens*
Cypress—*Cupressus*

Rabbits food clover—*Trifolium arvense*
Marsh marygold—*Caltha palustre*

and many others which have definite common names, and common names which are the same in all parts of the country. In connexion with this subject however, I must remark, that all plants are not fitted for such a use. A very large class of plants seem to grow almost equally well in almost all kinds of soil. In noticing what is technically termed "habitat" of a plant botanists very frequently mention it as "omnibus locis," i.e. growing in all situation, to all appearance equally well. There is another class of plants, much less numerous than the first mentioned, which do not thrive except in peculiar soils;—these and these only could be used for the purpose of nomenclature.

Before any regular system of botanic nomenclature for soils could be adopted, it would be necessary that we should have a much more extensive and accurate series of observations than has ever yet been made;—And yet perhaps I may safely attempt a commencement, at least enough to shew what is meant. Drawing my information principally from the 'Essay on Calcareous Manures' I would say, broom-grass land i. e. land on which broom-grass voluntarily springs up and flourishes, is naturally unfit for the production of wheat or corn, in consequence of its incapacity to retain putrescent manures. This evil is best corrected by the application of calcareous manures.

Brook-lime land contains a large portion of calcareous matter, and is best improved by the immediate application of putrescent manures, without any preparatory application of lime or marl.

Rabbits-foot clover land is for the greater part of the year very dry, whatever may be its appearance at the time when examined, and on this account, though it may produce corn or wheat pretty well, should not be put in grass unless some artificial method of watering can be applied.

March-marygold land is for the greater part of the year partially covered with water; whatever may be its appearance at the time when examined, and is on this account unfit for the production of any grain or valuable grass unless first improved by draining.

These instances are sufficient to illustrate my meaning. If such a system could be adopted, it would possess at least this one advantage; that any farmer after having learned the names of a few plants, would be able to determine the character of the soil which he cultivated without the application of any chemical tests, or any other examination than such as could at once be made by the eye; moreover he would be able to understand and apply with certainty any information which he might obtain from the experience of others.

Chap. XXII.

Terminology of Botany. Scientific names of plants, their nature and value as compared with common names.

"In all the natural sciences it is necessary to express, with the greatest possible brevity and precision, a large number of ideas which are beyond the resources of ordinary language. In order that accuracy and uniformity may be attained in describing natural objects, and that the language of scientific writers may be exactly comprehended," we are compelled to resort to the use of technical terms. In adopting a technical terminology for a science, two different methods may be pursued. 1st. We may take those words in common use which approach nearest in meaning to that which is required, and giving to them a strict definition, use them afterwards in conformity with that definition. 2nd. We may invent new words, or adopt words from other languages. In every instance however we must define our terms, and never lose sight of those definitions. In forming the terminology of botany both of these methods have been pursued. Those common words which from their nature are definite is their signification, such as the numerals, the words opposite, alternate &c. have all been adopted without any modification of meaning, and on that account cannot properly be considered as technical terms. Other common words which have not a very acurately defined meaning, have been adopted after giving to them a technical definition. Of this character are the words, hairy, linear, lanceolate &c. Others again, have been taken from other languages; principally from the Latin, and in their adoption, respect has been had in every instance to their original meaning;—Of this character are the words cordate, reniform, auricular, nectary &c. Without going into an examination of the reasons why each of these methods has been adopted, or the extent to which each of them has been pursued, it will be sufficient to remark, that in these ways a terminology has been gradually formed for Botany, which whilst it presents but few real difficulties to the student, more especially to the student familiar with the latin language, it possesses all that acuracy and definiteness which are so essential to scientific language. It is true, that at the outset, the array of technical terms which meets the eye of the tyro in botany, may lead to the belief that in their acquisition he will have difficulties of no common magnitude to overcome, but if he will set about the work in earnest, he will soon find that these difficulties, like many others, "loom largest at a distance." There are not more than forty or fifty technical terms in very common use, and as for the others which occur only occasionally, their meaning can be learned from any botanical dictionary, when they are met with, and need not be placed as a burden on the memory.

Where we have to speak of so great a number of individual objects as are presented in the vegetable kingdom, it is necessary that we should have some name by which to designate, not each individual, but each species of individuals. These names must not be long, or they will prove very inconvenient in use; and yet they must be entirely distinct from each other, or they will lead to confusion, and in either case they will prove a very serious obstacle to the progress of science. The system of nomenclature now in use among botanists is one first proposed by Linnæus. "Linnæus proposed that the name of every plant should consist of two words; one designating its genus, the other its species. The first is termed the generic name, and is always a substantive; the second is the specific name, and is usually an adjective." At the same time that he proposed this system of nomenclature, he gave a number of rules to be observed in the application of these names, which

have generally been attended to by succeeding botanists.

The most important of these rules are the following. 1st. Generic and specific names must be of Greek or Latin origin, and should always be written in Latin. This rule has not always been strictly observed. 2nd. The best generic names are those which indicate some obvious peculiarity of the genus; either as to the situation in which it grows, as *arenaria*, a plant that grows principally in sandy places; or such as mark the botanical characters, as *streptopus*, a plant the peduncles of which are bent in a remarkable manner, *hemianthus*, a plant whose corolla is apparently cleft or halved. 3rd. Genera may sometimes be dedicated to persons who have distinguished themselves in the science, thus, linnea, mecklenbergia, elliottia, &c. 4th. Specific names should be formed on similar principles with those of genera, only that more latitude is allowable in some respects. They should if possible be framed so as to express some distinguishing mark of a species, or some striking peculiarity in appearance, or to denote the peculiar situation in which the plant naturally grows. Viola *palmata*, and *pubescens* are examples of the first kind, *v. blanda* and *debilis* of the second, and *v. palustris* of the third. Comparative appellations may often be properly applied, such as *viola primulafolia*, *quercus olivaformis*, or to indicate a general resemblance, as *hypericum ascyroides*, *anemone thalictroides thalictrum anemonoides*. 5th. Specific names may be derived from the country the plant inhabits. Indeed a large portion of North American plants bear the name of Virginiana, Canadensis, or Americana. 6th. The names first published, whether of genera or species, are always to be adopted, even in preference to much better ones, unless the former are absolutely in contradiction to universally received rules. In framing new names it is desirable that the above rules of Linnæus should always be observed.

As many persons are disposed to undervalue the scientific nomenclature of plants, it may not be inappropriate in this place to make a remark or two respecting this matter. If we refuse to use these names, the only alternative which is left us, is to make use of what are called the common names of plants. To such a course there are several very serious objections. In the first place, the great majority of plants have no common names, at least such is the case in every part of our country. In Virginia, not one in a hundred among wild plants, has a common name by which it is generally known. Then in different parts of the country, the same plant is frequently known by different names, and what is still worse, different plants are frequently known by the same name. But even supposing that these difficulties were removed, and that we had a complete set of common English names for plants; those names would not be understood in France or Germany, and in each of these countries another set would be in common use which would be entirely unintelligible to us, so that the observations of the botanist or agriculturist of one country would of necessity be a sealed book to those of every other.

None of these objections will apply to the nomenclature in use among botanists. Names have been given to all known plants, and new plants as soon as discovered are named; these names are the same in every part of the world, and in no instance is the same name given to different plants. It is true that the learner meets with some difficulties in acquiring a knowledge of these names, but yet on the whole no greater difficulty than he would have to encounter in acquiring an equal number of what are called common names. At the present time, this nomenclature has been so long and so generally in use among botanists and scientific agriculturists, that any change, even if there were reasons for desiring a change, is entirely out of the question, and unless we will take the labor of mastering it, much of that which has been written both on botany and agriculture will remain forever beyond our reach. As an instance in point, I may mention the "account of a series of experiments on different grasses" given in the appendix to 'Davy's Agricultural Chemistry.' The information contained in that paper is of the very kind which it is most important, the practical agriculturist [whose attention is turned to the cultivation of grasses] should have. And yet without a knowledge of the botanical names of plants, it might almost as well be so many blank pages. It is true that the common English names are given, but unfortunately for us, the common names which are in use in this country are entirely different. To mention but one instance, and that of one of the most common and one of the most important of the grasses; the *phleum pratense*, the common name given in the paper referred to is meadow-cat's tail grass, and this no doubt is the common name in England. In some parts of the United States this grass is called timothy, in other parts it is called herds-grass; whilst the grass called herds-grass in the valley of Virginia is an entirely different grass. With this instance before us, we may see the true reason why the results of the experiments of different farmers, particularly of experiments upon the comparative value of the grasses, are so discordant. Difierent farmers have called the same grass by different names, or different grasses by the same name, and thus have been experimenting on very different things. In such circumstances it is no wonder that their conclusions are at variance with each other.

Chap. XXIII.

SYSTEMATIC CLASSIFICATION OF PLANTS. ARTIFICIAL AND NATURAL SYSTEM. COMPARATIVE MERITS OF THE TWO.

Besides a scientific terminology and nomenclature for plants, a systematic classification of them is necessary, in order that our knowledge of their peculiarities in structure, in habit, or in use, may be presented in such a form as to be easily acquired or easily retained. When the simple fact is stated, that more than 80,000 species of plants are now known to botanists, this necessity will be at once apparent. The full exposition of systematic classification belongs properly to systematic botany, and not to vegetable physiology; but yet as I have had occasion frequently to refer to classes and orders of plants, in the preceding parts of this essay, I should feel that I was leaving my work incomplete, should I fail to give a brief sketch of the two systems of classification in common use at the present day.

These two systems are commonly distinguished

as the artificial system and the natural one. The former is sometimes called the Linnæan system, from the name of its inventor, and sometimes also the sexual system, for a reason which will be apparent after examining it. This system is so exceedingly simple and easily understood, that it has, from the first, been deservedly popular with botanists, and has prevailed to the exclusion of all others. Soon after the different offices of the stamen and pistil had been ascertained, Linnæus conceived the plan of a classification of plants, founded upon peculiarities in these organs, in number, situation, connexion, &c. This he afterwards accomplished and presented to the world in his 'Species Plantarum.'

A good idea of this system will be obtained by examining the following synoptical view of it, extracted from Gray's Botany.

- Plants having
  - stamens and pistils manifest
    - both found in the same flower
      - stamens separate from the pistil.
        - unconnected with each other
          - of equal length
            - Stamens 1.....Class 1st, Monandria,
            - " 2.....2nd, Diandria,
            - " 3.....3rd, Triandria,
            - " 4.....4th, Petrandria,
            - " 5.....5th, Pentandria,
            - " 6.....6th, Hexandria,
            - " 7.....7th, Heptandria,
            - " 8.....8th, Octandria,
            - " 9.....9th, Euneandria,
            - " 10.....10th, Decandria,
            - " 11 to 19.....11th, Dodecandria,
            - " 20 or more adhering to the calyx,.....12th, Icosandria,
            - " 20 or more not adhering to the calyx,.....13th Poliandria,
          - of unequal length,
            - 2 long and 2 short stamens.....14th, Diagnamia,
            - 4 long and 2 short stamens.....15th, Tetradynamia,
        - connected with each other
          - by their filaments in 1 set.....16th, Monadelphia,
          - by their filaments in 2 sets.....17th, Diadelphia,
          - by their filaments in more than 2 sets.....18th, Polyadelphia,
          - by their anthers.....19th, Syngenesia,
      - stamens adherent to the pistil.....20th, Gynandria,
    - in separate flowers
      - on the same plant.....21st, Monæcia,
      - on different plants.....22d, Diæcia,
      - some flowers perfect, others separated on the same, or 2 or 3 different plants.....23rd, Pylygamia,
  - stamens and pistils concealed, or none.....24th, Cryptogamia.

From an inspection of the foregoing synoptical view of Linnæus' system of classification, it will be seen that, the first eleven classes are characterized by the number of the stamens, those stamens being disconnected with each other, and of equal length; the two succeeding classes, viz. the 12th and 13 derive their characters from the number and insertion of the stamens; the next two classes, the 14th and 15th are based upon the number and relative length of the stamens; the next four classes, the 16th, 17th, 18th and 19th upon the connexion of the stamens with each other; the next class, viz. the 20th is founded on the adhesion of the stamens to the pistil; the next three classes, the 21st, 22nd and 23rd are characterized by the stamens and pistils growing in different flowers, either upon the same or upon different plants; and the remaining class, the 24th, includes all those plants whose flowers if they may be so called, have no evident stamens and pistils; of this character are the ferns, mosses, &c. In order to determine the Linnæan class of any plant, all that is necessary is simply to examine its stamens in the particulars referred to. The subdivision of these classes into orders is generally based upon some peculiarity in either the stamens or the pistils, characteristics taken from the stamens being used where they are not necessary in determining the class. There are however a few exceptions to this general rule; viz. the orders of the 14th class are based upon the presence or absence of covering to the seed, those of the 15th class upon the shape of the seed-pod, and those of the 24th class are truly natural orders, and ought not to be considered as properly parts of an artificial system.

"The object proposed by the natural system is to bring together in groups those plants which most resemble each other, not in a single character only, but in every essential point; so that a knowledge of any one individual of a group, will give an adequate idea of the structure, habits, and general properties of the whole. The subordinate groups being combined into larger assemblages, and these again into still more comprehensive divisions, the whole vegetable kingdom is at length embraced in the general classification. Thus, the genera are groups of kindred species, the orders are assemblages of kindred genera, the classes and subclasses are still larger assemblages, embracing orders, agreeing with each other in certain general and important particulars." In arranging plants according to such a system as this, it is necessary to pass in review every separate organ, and not to confine our attention to a single class of organs, as in the case of the Linnæan system; and besides this, we must determine respecting the relative value of the characters afforded by each class of organs; as a plant will be found to agree in some of its characters with one family of plants, and in others perhaps equally numerous, with an entirely different family. It is from this last mentioned source that the principal difficulties arise in giving to plants a natural arrangement.

And here, it may be worth our while to devote a little space to a brief examination of the relative importance of the different characters afforded by the different organs of plants, as it will give us, not only a fuller insight into the nature of the natural system, but also a better idea of what observation has taught the botanist, must be considered as permanent in the structure of a plant, and of course in what particulars it will be impossible by any artificial means to alter or improve it. And here, I shall draw my information principally from the chapter on classification in Gray's Elements of Botany, a work to which I have frequently had occasion to refer in the foregoing parts of this essay.

Every organic peculiarity in which plants differ or agree among themselves, is considered by the botanist as a character. In determining respecting the relative attention which should be paid to each, their permanence is one of the first things inquired into, those which are most permanent, being of the highest value; and those which are most variable, of the lowest. Thus the seed-vessel and the seed being produced year after year without any perceptible variation except in size, they furnish constant and permanent characters, but the color of the flowers, the surface of the leaves whether smooth or hairy, the height of the stem, &c., being liable to great changes, much less dependence can be placed upon them as distinctive characters. The highest character presented by any organ is drawn from a consideration of its presence or absence; thus the two great classes of flowering and flowerless plants are distinguished by the presence or absence of flowers. The characters next in importance are those furnished by the position or arrangement of any class of organs; thus the two great groups into which flowering plants are divided are distinguished by the arrangement of the cellular and vascular tissues; the first [exogenæ] having the vascular tissue arranged in concentric cylinders, around a common axis, the pith; and the second [endogenæ] having this tissue disposed in bundles and not in cylinders. Characters drawn from the form, connexion, relative length and relative number of organs, are next in importance, such as the number of stamens, pistils, seeds, &c. The abundance of any tissue, intensity of color or odor, the degree of pubescence, &c. are all characters of the lowest rank, being of themselves insufficient to distinguish species.

The *root* furnishes fewer characters than any other organ, the subterranean modifications of the stem, such as bulks, tubers, &c. are of more importance, but even as respects these, we often find plants which should evidently belong to the same natural family differing from each other.

The *stem* in its ordinary modifications, furnishes numerous characters of great importance. Its structure, whether exogenous or endogenous, distinguishes the two sub-classes of flowering plants from each other, as has been already remarked. The natural order of grasses are distinguished by having cylindrical and hollow stems, closed at the joints. Plants belonging to the natural order of labiatæ, which the garden sage (*salvia officinalis*) may be mentioned as an example, have in almost every instance square stems. All the plants of the Carolina allspice tribe (calycantheæ) have stems with four imperfect centres of growth, on the outside of the ordinary concentric circles of wood.

Leaves afford a great variety of characters of different degrees of importance. The outline or figure of leaves is much more variable, and of course, of much less importance than their arrangement on the stem. All Labiate plants have

opposite leaves, whilst those of the ranunculus or butter-cup tribe have as constantly alternate leaves. As to connexion with the stem, it is observable that the leaves of endogens never separate by an articulation, but decay without falling; whilst a true joint is formed, sooner or later, in all exogenous plants. Characters of great importance are furnished by the manner in which the veins of leaves are arranged. Thus the gourd tribe exhibit the radiated form of veining, the amentaceæ [ex. oak] the feather-veined form, and the myrtle tribe is distinguished by the presence of an intra-marginal vein, formed by the confluence of the veinlets just within the margin.

Among the floral organs, the *pistil* affords more important characters than any other. Botanists always notice, whether this organ be inferior or superior, or, in other words, adherent to the calyx or free from such adhesion. Careful attention is also paid to the structure of this organ, particularly to the number of carpels of which it consists.

The *fruit* being the ripened pistil, the characters it affords are of nearly the same value as those of that organ, and several additional ones are afforded by the texture and dehiscence or indehiscence of the pericarp. The texture of the fruit rarely furnishes unexceptionable ordinal characters, since membranous, woody, fleshy and berry-like fruits are sometimes found in the same family, and even in the same genus; it however usually affords good generic characters, if we make allowance for occasional exceptions.

The *seed*, which unites in itself the characters of reproduction and of vegetation, affords more important characters than any other organ. The presence or absence of albumen is, with some qualifications, a most important character for distinguishing orders. The texture of the albumen, when this substance is present, is also taken into account. Thus it is oily in the poppy tribe, mealy in the buck-wheat tribe, in gramineæ, &c., horny in the umbellifera, and ruminated in the nutmeg tribe.

The *embryo*, or miniature plant contained within the seed, is found to afford characters of the highest importance. Its presence distinguishes flowering from flowerless plants; the want of one cotyledon distinguishes exogenous from endogenous plants; and its position with respect to the albumen distinguishes gramineæ from cyperaceæ. It is true that some of the characters afforded by the embryo are often minute and somewhat difficult of observation; but their constancy renders them extremely useful.

It is impossible for any one to become familiar with a large number of plants, and not group them together, in accordance with certain observed resemblances. Evidence that the mind naturally goes through with such an operation, is afforded in the names which are frequently given to wild plants; thus, there is a very common wild plant, called partridge pea; this name it doubtless received from a resemblance observed between it and the garden pea; but wherein does this resemblance consist? Perhaps few, whose attention has not been particularly drawn to this subject, could at once tell. They have observed a general resemblance, and there their observation has stopped. In this particular instance, the resemblance is not in the shape or texture of the leaves, nor in the general character of the stem, for in these particulars the two plants in question differ widely from each other, but in the form of the flower and in the character of their seed. The violet also resembles the garden pea in the general shape of its flower, and in its stem and leaves it is as much like that plant as the partridge pea is; and yet no one would think of classing the violet and pea in the same family, because its seed and seed vessel differ so much from those of the pea. It is the object of the botanist, in forming a natural classification of plants, to lay hold of these observed resemblances, inquire into their nature, and to arrange plants according to them.

"The object of the artificial method is merely to furnish the means of readily recognizing individuals, and arriving at their names; the natural method. with this object also in view, proposes moreover to arrange plants so that those most resembling each other in all important particulars shall stand side by side, and form groups by themselves; which groups are also to be arranged according to their mutual affinities into larger groups, and these again into still larger; all of which are to be disposed in the order of nature. This method accordingly, if perfectly carried out, must express both the near and remote relations established by nature between the individuals of the vegetable kingdom. An artificial method is easily contrived, as it may be founded on the diversities of form, &c., presented by one or two organs; its application requiring nothing more than a knowledge of structure sufficient for the observation of these diversities. On the other hand *the* natural method, (for there can be but one,) is not contrived, but discovered; and as it expresses the affinities and analogies imprinted by nature upon the members of the vegetable kingdom, it cannot be said to be wholly perfected until all existing plants are discovered, and properly described and arranged."

The principal advantage possessed by the Linnæan artificial system is its extreme simplicity, and the consequent ease with which it enables the tyro in botany to ascertain the name of any plant. But there are some very serious objections to this system. One is, that in many instances it widely separates kindred plants; and as frequently brings together, those wholly unlike each other in structure, appearance, properties, and indeed in every particular excepting the number and arrangement of their stamens and pistils. Thus whilst the mint balm, horehound, and the major part of the mint tribe, are placed in the class didynamia, sage, the water horehound, the horse mint &c, plants universally recognized as belonging to the same tribe, as their popular names denote, and agreeing with the others in every particular except in having but two stamens, are arranged in the class piandria. On the other hand, what resemblance can be traced between the lilly and the bullrush, the cucumber and the pine, except in the single particular of the number and arrangement of their stamens and pistils? A second objection is, that very perplexing difficulties often meet the student, arising from the irregularity in the number of stamens, styles &c. in the several species of a genus, or in different individuals of the same species, or sometimes even in different flowers of the same individual. Thus, the greater part of the species Stellaria have 10 stamens, and Linnæus accordingly placed the genus in the class decandria; but the common chickweed, [S media,]

the species which of all others the student will probably first have occasion to examine, has usually five, often three, and very rarely as many as ten. This difficulty is not one of very uncommon occurrence, as will be evident from the fact that out of 274 genera, the whole number of common North American genera embraced in the first 10 classes of the artificial system, 78 genera contain species which are uniformly on commonly at variance with the class or order to which they are referred.

Neither of these objections can be urged against the natural method; it is the very object of that method to arrange plants according to their mutual affinities, and if in any instance plants which do not resemble each other have been placed together, in that particular there has been a departure from a strict natural method, and a departure too, which the future labors of the botanist will correct. The greatest objection to the natural system is its necessary complexity; and this is an objection which can by no possible means be removed. Yet the difficulty arising from this source is not as great as it is generally supposed to be. It must be confessed that where the object of the student is simply to learn the name of a plant, and where he has not much time to devote to botanical studies, the Linnæan system is to be preferred; but where it is his object to make the nature and structure of plants his study, to acquire an insight into the curious mechanism of vegetation, and he has time to devote to the study, the natural method is incomparably the best.

(To be continued)

ON MANURES.

From the Edinburgh Farmers' Magazine.

Sir,—The following remarks are on an important subject, and, if they can, with propriety, be inserted in your useful miscellany, I am convinced they will do some general good, both to agriculture and to the community at large.

No article in husbandry and gardening is of more consequence than manure. The labors of the cultivator and the researches of the naturalist, are more less advantageous to a district, according as abundant supplies of manure can or cannot be obtained. The sources whence this substance can be drawn are limited by nature, and by various circumstances. The chief supply is from cattle; but as it is impossible to maintain a quantity of these commensurate with the improvements by which husbandry could otherwise be advanced, manure is evidently a most important *desideratum* in every district.

The process of nature in preserving the balance betwixt animal and vegetable existences is wonderful. The former inhale the effluvia with grateful and salutary sensations which the latter throw off; and they derive health as well as nourishment from their productions. The latter receive their support and their salutary influence from the exuviæ of the former, and are more or less vigorous according as abundance of these are supplied. To both classes of existences it is an advantage to be relieved of their fruits; and to both, culture and cleanliness are peculiarly salutary.

But this invaluable species of manure is, to our fastidious sensations, so loathsome, that we as speedily as possible banish it from our sight. When men were scattered over extensive fields, this was natural and useful; but, when closely penned together in cities, the same art that preserves them there, and regulates the motion of all their natural propensities, must be exercised in relieving them from this disagreeable feeling. As things are managed in this and in most other large cities, human exuviæ are indeed put out of sight, but that is all; for nearly their whole substance is decomposed in the atmosphere which we breathe; and the remainder, after attaining its last degree of loathsomeness, is deliberately carried under our noses to that situation where alone it can be got quit of altogether.

From the process we observe going forward in the country, in church-yards and elsewhere, where putrid and fermenting substances are neutralized and absorbed without noisomeness and without difficulty, it is astonishing that a similar process should not have been instituted at home. Two things only are necessary,—to have no unnecessary mixture of fluidity, and to supersaturate the exuviæ with ashes, soil, or any carbonaceous matter.* The fluid part of exuviæ is known to be invaluable in many manufactures, and cannot be collected in sufficient quantities for their purposes. The sweepings of a house, and the ashes produced in the grate, might without any other assistance, supersaturate the rest. But for the attainment of health and cleanliness, no one surely will grudge (when it is necessary) the trouble of getting sand, or some such substance, to complete this supersaturation. Our artists now bend their genius to every improvement in every object. Can an article of furniture for accomplishing these objects, therefore, be considered as an extraordinary improvement?

To me it appears quite practicable to collect the whole exuviæ of this metropolis, amounting annually to some thousand tons, by such means as I shall suggest. The hand of the magistrate might here, as in most municipal improvements, be useful in the beginning, and in the superintendence of this matter; but individual interest would afterwards, I am persuaded, do the rest very fully.

I would propose to have from twelve to twenty public temples of Cloacina erected in convenient situations, and each under the superintendence of its owner or his lessee. I think these temples ought to be kept clean, by supersaturating and removing every thing of an opposite kind; that they ought to be neat and commodious; of a convenient form, and in such a position, that they should either be on a step, or be a half story up; that the reservoirs should be built round with ashlar, and floored, and have such an inclination of the sides as to make the bottom narrow, which bottom ought to incline towards the back, in which the door, or fixture by which the contents are to be removed, should be placed; and, the bottom being sufficiently raised above the ground below, the cart could be carried under it. A few motions with the shovel would by this means discharge the contents of the reservoir into the cart, which would proceed through lanes and by-paths into the country.

In order to collect the whole exuviæ of a neighborhood, I would make this distribution a matter of labor and attention. Every morning at an early hour, let the proprietor of the ward reservoir

* Rich marl preferable by far.—Ed F. R.

or his servant, go through and collect the domestic contents. Those ought to be collected in each house into a square box, with a lid, in a supersaturated state, which box the lessee would carry with him, leaving another for the use of the next day, with a quantity of saturating matter, as ashes, dried soil, &c. He might also collect the fluid exuviæ for the benefit of the manufacturers, in a separate jar; these boxes might be put upon his barrow below, by which he might carry them into the ward deposite, emptying each box therein by a side door, taking care, however, to supersaturate the whole.

As the sweepings of the streets and other rubbish might not be sufficient for all this supersaturation, the carts that carried off the rubbish might, in coming in from the country, bring a quantity of the matter necessary for this purpose, which could be distributed about the ward in the morning by the proprietor or his servant in the returned box. It would be proper to begin with carefully covering the bottom of the box. The top of the contents also, in like manner, should be covered with equal care.

The great difficulty to overcome is, to make this a work that persons can go about without difficulty or disgust. Nothing but supersaturation can prevent the last, and the due system of police the first. Penalities for throwing exuviæ out of the windows, and certain immunities secured to the proprietor or lessee of these temples, are necessary. But were the work once keenly set agoing, a variety of improvements might succeed; and the business, like many others of those that were from the first disagreeable, might be clothed with decency, and even, in course of time, with not unseemly flowers and ornaments.

I beg pardon for being so minute; but it is impossible to expect any advantage without this; for as people recoil from this subject as a thing unfit for notice, they must be convinced, not only of its expediency, but also of its practicability.

I shall conclude with just noticing that were the system, above recommended, adopted throughout the kingdom, many thousand acres of ground would be made of double their present value. Many thousand invaluable plants, now rare, would be produced in our gardens; the atmosphere of our towns and streets would be purified; and numbers of people not only supplied with labor, but with labor of the most productive kind to the kingdom.

GLAUCUS.

Edinburgh, 19. *May*, 1809.

ON HUMAN EXUVIÆ AND SOIL-HOLES.

From the Edinburgh Farmers' Magazine.

Sir,—In adding to the hints of your correspondent *Glaucus*, in last number, I do not think it necessary to follow him in his sort of half apology for commenting on stercoraceous subjects. It would be ridiculous to suppose that the readers of the Farmer's Magazine will regard any discussion as repulsive which is connected with the improvement of their art; and, in truth, none but the 'nasty ideas' of 'nice people' will ever find any thing repellent in discussions (with due periphrasis, to be sure) connected with the Cloacinean goddess. This letter then, sir, (not to offend your more squeamish readers with calling things by their right names), will treat of human *exuviæ* and *soil-holes*.

Ideas similar to those which have been urged by *Glaucus*, and by Dr. Hunter in one of your early volumes, relative to the importance of collecting these exuviæ more carefully, have often struck me. There can be little doubt that the annual *ejectamenta* of an individual, if properly applied to an acre of soil wanting manure, would enable it to produce a quarter more of grain of any kind, than without this application; but, to be within the mark, let us say one fourth of this, or two bushels; the value of which we will call ten shillings. The amount, then, to which, by this application, the national wealth may be reasonably supposed capable of being annually extended, is, in the whole empire, no less than eight millions of pounds. Now, what proportion of this manure may we conjecture to be at present profitably applied? In the country, doubtless, the greater part, and in many large towns a partial proportion. But, in some of our populous cities, there is reason to believe that nine tenths of this manure is utterly wasted. On the whole, it may be fairly assumed, that not more than one half is profitably applied. By this neglect, therefore, a national loss of four millions is anually sustained. Is it not worth while to inquire how this may be avoided, even though at the risk of turning the stomachs of some over nice readers?

The first question to be resolved, is, in what way are the human exuviæ of your great cities wasted? Generally, of course, by being conveyed into the common sewers, and from thence to fatten the *fuci* in the ocean, instead of augmenting the produce of our fields and pastures. The *bogs* of London seem commonly to communicate with the sewers: but I confess I was always puzzled to guess whither the pipes of the *water-closets*, now so frequent, are conveyed. I conclude however, to the same quarter. How is this waste to be remedied? The rich will doubtles continue their water-closets. If they communicate, therefore, with the sewers, their contents must be wasted. The *bogs* might perhaps be abolished, and more economical repositories be abolished, and more economical repositories provided. The mode may be best explained by detailing the practice in this respect at a neighboring town, where there are not, I venture to say, ten cart-loads of human exuviæ wasted in a twelvemonth.

In Hull, the place I allude to, every house is provided with a soil-hole. This is a *sine qua non* to the meanest tenement, and the very first *desideratum* that a builder considers essential. None of these communicate with the sewers. They are usually very small, and with but one seat; in the front of which is an opening, closed in common by a square board, which fits pretty accurately, and is fastened by two wooden buttons or nuts. The bottom is made to slant a little towards the back of the building; but is rarely more than a few inches below the floor. Into this seat all the ashes made by the family are constantly thrown. The consequence is, that the exuviæ are so completely neutralized that no offensive smell is felt, though they are often built close by the back-doors in very confined yards. The dustmen, as they are called, of whom many have accumulated considerable fortunes, send their carts and men every

two or three days, to clean out these soil-holes. This is effected by merely opening the front board, and shovelling the contents into a tub, which is emptied into a cart. So completely is every thing fluid absorbed by the ashes, that no dirt is made by this process, nor is it at all offensive to pass one of these carts in the street:—you merely see what appears to be a load of ashes. This manure is eagerly bought by the adjoining farmers; and often shipped and sent up the rivers to a great distance. Of course, the price is high; and the dustmen consider it a *favor* to be allowed to clean out a soil-hole gratis. They never think of demanding money; and often, I believe, *give* a gratuity to the servants. How should they do otherwise, indeed, when they sell this manure for six and seven shillings a cart-load of about a ton? This price I paid some years ago for two lighters-full, the freight of which was as much more. Now, I believe, it is higher. As a proof of the value set upon manure at Hull, it may be stated, that the magistrates have more than once published threats of punishment to those who should secretly *sweep the streets*, to the injury of the scavengers who had contracted to clean them; and that there is quite a competition amongst children with wheel-barrows, and old men with carts and asses, who traverse the town, carefully sweeping up every heap of horse-dung casually dropped.

The general adoption, in large towns, of the practicable system above detailed, would fully answer the wishes of *Glaucus*; would create a vast annual accession of national wealth; and would supplant the *'ha'd your hand'* nuisances which are experienced in some places. Still, however, a vast quantity of valuable manure will always be conveyed to waste down the sewers of a large city. To turn this to account, the plan proposed by Dr. Hunter is very feasible. Let the outlets of such sewers be surrounded with reservoirs constantly furnished with a succession of absorbent materials, that would drink up the precious fluid as fast as it arrived. Nothing could make better manure than such a saturated mass.

BURYING BEES IN WINTER.

From the New England Farmer.

Our last swarm came off in June, and notwithstanding the old adage that "a swarm in June is not worth a spoon" we should refuse an offer of two spoons for this, and more, unless they were very nice and very heavy. True, the quantity of honey which they have gathered is not very great, but, with our way of managing such hives, we think amply sufficient for their supply. We propose burying them through the winter, a practice which we have adopted in two successive years, and had we continued it the third, our old colony, instead of coming to an utimely end, would probably have been in existence now through its descendants.

My method of burying bees is as follows. The operation is performed the last of November. The pit in which they are to be placed is dug considerably larger than the hives, in every respect. On the bottom of the pit two sticks say of scantling, four inches square, are so placed that a cavity may be left into which the water if there is any may settle, and run off without injury to the bees. On these blocks I lay my floor board, which should be *sound* and full an inch thick; if more, no matter. The top of the hive should be covered with a two inch plank, or if more convenient, a piece of wide thick slab with the rounding side up, so that if the frost comes out, and heavy rains fall, it may serve as a roof to carry the water from over the hive and turn it into the pit below. Straw is then placed as compactly as may be around the hive, and the earth thrown on so as to form a cone above it, which again operates as a roof to turn the water as it falls. With regard to the depth of burying, we can only say, that in our former experiments, we never sunk the top of the hive below the surface. Whether it would be well to do so we cannot say. Some, when burying their bees, drive down a stake near the hive, as they say to admit the air; but we do not see why a stake, drove with the earth compactly placed around it, can form an air hole more than the earth itself. And if it could, we do not see the necessity of it, for the object of burying bees is to put them as much as may be in a state of dormancy through the winter, by which their stock of provisions is lengthened out, to secure them from sudden and often fatal changes from heat and cold and from storms and sunshine.

In selecting a place for burying, it is important that a *dry* one should be chosen, and *we* prefer one that is cold to a warm one, and could we regulate the condition of the earth around them, we would freeze it the night after their burial, and *keep* it *frozen* until time for their exhumation in the spring.

We, in both instances of our former burying, took them up some of the last days of March, and all the dead we found from the four hives thus kept would not half fill a person's hand, and on exposure to the sun and atmosphere, the living were as bright and lively as though they had known no winter, and they gave swarms earlier and more frequently than did the hives that were not buried, the ensuing summer.

AN ENGLISH GRASS FARM.

From the New England Farmer.

Mr. Editor.—During my residence abroad, I spent one summer and a part of the autumn at Merton, in Surry, domiciled with a Mr. Raine, tenant to Mr. Middleton, author of the Agricultural Survey of Middlesex, with whom I was acquainted. It was a hay and grass farm, and the management of it was of the best description. It consisted of 160 acres, all improved as meadow, no plough being used on the place except in the garden. The course adopted was as follows.

Early in the spring the fields were all shut up. As soon as the hay was secured, and this was a great labor, the teams commenced carrying it to London for sale, *loading back with manure.* And now commenced that course of judicious conduct which excited my warmest admiration at the time, and has remained my beau ideal of good management ever since. The second growth of grass being well shot up, Mr. Raine went to the cattle fair, and bought large beeves, in high condition. In his rich and clean meadows, these were soon ready for Smithfield market, to which they were

sent, and their place supplied by other beeves, still in high condition, but of much smaller size. On the removal to the shambles of the second herd, still smaller cattle, in fair condition, were bought, to be initiated into a still higher preparatory degree of fatting. These were sold off, and were succeeded by small lean cattle from the Welsh mountains, to be improved as stores. The fifth set of temporary tenants of the farm were small sheep, to be wintered.

The farm, as I have remarked, consisted of 160 acres. The rent paid was £2 10s per acre, at $4.80 the pound sterling, twelve dollars per acre, £1,920 for the farm. Paying this enormous rent,—saddled with heavy taxes, and at a large outlay for manure and farm servants, Mr. Raine was still accumulating large riches upon it. His house was in the style of a gentleman, and his expenditures on a most liberal scale, but he owed nobody a farthing.

We are poor farmers in this country, Mr. Colman, very poor farmers, as Alfred Jingle would say, very. Those of us who do best, are very far from doing as English farmers do. They make more profit per acre from the *borders of their fields* than we make from our best intervale; realize as much gain in the shifting stock to consume the herbage of a single summer, as we do from growing for three years the same number of head. Every thing there is made to produce profit. As large a capital is invested as we invest in a thrifty commercial business. No man can rent a farm who has not a sufficient capital to stock it, work it, and lay out of the price of a year's harvest. The outlay of capital on a large farm is very great. A fair estimate of the required sum on a farm of a thousand acres, is five thousand pounds sterling. It would astonish the American farmer to see the book of "bills receivable and payable" of an English lessee of a farm. Yours,

J. A. I.

THE AGRICULTURAL STATE OF SCOTLAND.

From the Cultivator.

And what has that to do with American husbandry? it may be asked. Much, we reply. We may learn from what Scotland *was*, and what she *is* in agriculture, many useful lessons in farming. We may learn our own errors in practice; and, if we are not too proud, or too conceited, we may learn, from Scotch lessons in farming how to correct them —we may learn from them how to double at least, the products of our agricultural labor. The history of Scotch agriculture for the last fifty years, is invaluable to every farmer who would improve his practice. History is wisdom, teaching by example.

We find a valuable essay in the 'Edinburgh Quarterly Journal of Agriculture,' showing what Scotland *was*, and what she *is*, in regard to her agriculture. She was, in 1784, two years after the close of our revolution, "as poor as a *church mouse*." She is now, perhaps, the richest in agricultural products of any portion of Great Britain, at least so far as regards her arable lands. The writer describes the face of the country at the middle of the last century, as "no better than that of a bleak, howling wilderness," and well, he adds, might the poet at the inn window indite—

"Bleak are thy hills of north,
Not fertile are thy plains,
Bare-legged are thy nymphs,
And bare —— are thy swains."

"In 1784, a few gentlemen, full of zeal for their country, and it may be a little love of society, formed themselves into a sort of hole and corner club, in a coffee house called the Exchange, situated in the court of that name, near "the market cross of Edinburgh." Here, in the enjoyment of agreeable conversation and a good supper, did those worthies talk over plans for the amelioration of the high-lands, and from this nucleus arose the now widely extended and powerful Highland Society." * * "To say what was the state of agriculture in Scotland at the date of the formation of the Highland Society, would, to treat of it minutely, require greater scope than the limits of a periodical admit." "But to take one sweep over hill and dale, cornfield and meadow, we may at once pronounce the agriculture of Scotland, at that period, to have been wretched—execrably bad in all its localities! Hardly any wheat was attempted to be grown; oats full of thistles was the standard crop, and this was repeated on the greater part of the arable land, while it would produce twice the seed thrown into it: turnips, as part of the rotation of crops, were unknown; few potatoes were raised, and no grass seeds or clover were sown. The whole manure of the farm being put on a little bit of ground near the farmstead, and there they grew some barley of the coarse sort, termed *bere*, wherewith to make bannocks, broth and small beer, or peradventure, if the farm lay at the foot of the Grampians, to brew a portion of 'mountain dew!' Since the writer can recollect, a great part of the summer was employed in the now fertile shire of Fife, in pulling thistles out of the oats, and bringing them home for the horses, or mowing the rushes and other aquatic plants that grew on the bogs around the homestead. Such was the state of Scotland, with but little appearance of amendment, up to 1792."

The general outline of this picture of wretched husbandry is suited to the present condition of many districts on the eastern borders of our country, though the filling up of the picture would require to be somewhat different.

"Time, with her ceaseless wing, had now brought in another century, and on the arrival of the nineteenth, the richer part of the low country had put on another aspect. Beautiful fields of wheat were to be seen—drilled green crops and clean fallows every where abounded—the bogs had disappeared—the thistles no longer existed. In the Lothians, all this was carried on to a great extent. The farmers forgot themselves—they were coining money, and 'light come, light go,' was their motto. They went on in the most reckless manner—they began to keep greyhounds, to be members of coursing clubs, subscribed to the 'silver cup,' or 'puppy stakes,' and yelped the same note of folly as their betters in birth, their equals in extravagance and vice. Then followed yeomanry races—the good sturdy nag that would be of use *at a time* in the operations of the farm, was exchanged for a blood steed, and on market-day, instead of rational conversation about matters connected with their own calling, they began to talk '*knowingly*' about the turf. At this time, that is, from 1810 to 1814, the agricultural horizon

was the brightest; the gas was fully up, the nation was alive; all was activity and business."

But at this time the battle of Waterloo came, and with it peace and low prices. Farmers could not sustain their extravagance—they had been unable to bear prosperity—and their farms fell into the hands of more prudent managers. We have seen much of the same routine of industry, extravagance and poverty, among the farmers of our own country. Not willing to 'let well enough alone,' they have embarked in speculation, or in pursuits to which they were strangers, and have gone into extravagancies and follies, to ape the great, which their means did not warrant, and which neither their comfort nor the welfare of their children required. The consequence often has been, that, like the indiscreet Scotch farmer, their lands have come into the possession of more prudent managers.

But though Scotch farmers failed, from not knowing how to bear prosperity, Scotch husbandry did not retrograde.

"In 1815, the turnip husbandry had got a firm hold in the country—the benefit accruing from it was so apparent, that no convulsion in the market prices could make the farmers forsake it."

Yet the culture was limited, owing first to the want of manure to feed the turnip crop, destined to fatten the farm stock; and secondly, to the expense of driving their cattle to a distant market. Two discoveries removed these impediments. The first, "the most important," says our author, "that ever occurred in the annals of agriculture, viz., that of *bone dust*," and the second, the *application of steam*, by our countryman, Fulton, to the propelling of vessels, which enabled the Scotch farmer to transport his fat animals to Smithfield market, at a moderate expense. "So palpable was the benefit to be derived from the use of bone manure, that in a few years there was not a farmer who did not avail himself of it. The farmers could now grow turnips to any extent, and the bare fallow was exploded." We have bone dust, and poudrette, and other newly discovered means of fertility, which the farmer is shy of buying and using. We have tried them all, and are satisfied both of their utility and the economy of their application, especially upon naturally dry or well drained soils. They add much to the products of agricultural labor, without any thing like a corresponding outlay. The Scotch farmer could now grow turnips to any extent. He could fatten upon these his stock, and he could send this stock to market at a trivial expense, for the "steam engine had become his drover."

But another—a third improvement followed, which we have yet to learn the value of—we mean *furrow draining* on flat and tenacious soils. Hear what our author says upon this subject:

"No man holding land ought to be ignorant of the thorough or Deanston drain. Mr. Smith, deeply engaged in the cotton spinning trade, could not procure a fall of water on the river Teith, ten miles west of the castle of Sterling, without renting along with it a considerable portion of very bad and wet land. Not liking to have a heavy rent to pay for such trash, Mr. Smith turned his powerful mind to the subject, and perceiving the folly of throwing away large sums of money on deep and useless drains, with all the stuff of tapping and boring, to *catch* the water, as if it were a wild beast for which gins and traps must be laid, hit on the idea of making drains in parallel lines in the hollow of every ridge, cutting them to the depth of thirty inches, filling them with small stones half way to the surface, above this putting a green turf reversed, and replacing the mould. Following up his first discovery by ploughing deep, he has now a farm of the finest land ever seen; and so convinced is the writer of the utility of this mode of draining, that each year he has been increasing the quantity he has made, and during the last twelve months has put in above fifteen miles. Nor is the Deanston drain confined to those parts of the country where stone or gravel can be procured: the same system can be and is followed with the same effect, by using the Marquis of Tweeddale's tile; or even the poorest farmer, who has not capital to undertake costly improvements, can fertilize his farm by making the thirty inch drains and filling them with brushwood. It is perfectly wonderful to behold the mighty change this thorough-drain system is making in the different parts of the country where it is in operation: wet land is made dry, poor weeping clays are converted into turnip soil, and even what would formerly have been accounted dry, is advanced in quality. Whole parishes in the vicinity of Stirling are completely transformed from unsightly marshes into beautiful and rich wheat fields, and where the plough could scarcely be driven for slush and water, we see heavy crops per acre and heavy weight per bushel, the quantity and quality alike improved." * * * * *

"It is the greatest quantity produced at the cheapest rate that will ever make a prosperous trade. If wheat is low in price, the farmer must bestir himself. Let him remember that if he can but grow one or two quarters more per acre, he will be in a better position, even with the low price, than he was before."

In speaking of the Highland Society, the writer enumerates the following means which that society adopted, as contributing largely to the mighty advance of the agriculture of Scotland:

"In the days of its youth and feebleness, the Highland Society sent the leaven of the turnip husbandry into all the glens and straths of the north, by offers of small prizes to certain Highland parishes; and the same may be said as to the growth of clover and the finer grasses. As it advanced in strength, (as to numbers and to cash,) attention was turned to premiums for stock; then came offers of reward to men of science to discover better implements and machines, to diminish friction and consequently draught, such as in the thrashing mill and other parts of agricultural machinery. Still advancing in the scale of intellect and of science, premiums were offered for essays to bring to light the facts connected with chemistry and natural philosophy; and, under the auspices of the society, was set up the 'Quarterly Journal of Agriculture,' a work which has been the vehicle of conveying so much useful information to the agriculturist, that we humbly venture to say it ought to appear on the table and book shelf of every farmer's parlor. After this, the great stock shows were resolved upon, as another link of union between the society and the practical farmer, at the same time throwing aside all paltry feeling, and making them open to stock from both sides of the Tweed, [i. e. from England as well

as Scotland.] How well they have succeeded, let the last one at Glasgow bear witness. [This was the most splendid show of fine cattle ever exhibited.] Nor has the society forgotten the beauty of the country, as the premiums offered in regard to planting trees and such like subjects fully testify; and to sum up all, it may be said, the Highland Society has been a *point d' appui*, a rallying point, to which the agriculturists of Scotland might look, and a fostering mother to all who, although strong in talent, were weak in interest to make it public. An ardent lover of the plough and all that can speed it, the writer of this article would advise the society of England, and all other agricultural societies who would be useful to their country, to look into the annals of the Highland Society, and from them to cull whatever may be of use in the advancement of the delightful science, the culture of the fields.

"The men
Whom nature's works can charm, with God himself
Hold converse; grow familiar day by day
With his conceptions; act upon his plans,
And form to his the relish of their souls."

The Highland Society have this year offered prizes to the amount of $17,000, under the following classification:

Class I.—Agricultural machinery, 500 sovereigns and a gold and silver medal.

Class II.—Essays and reports on various subjects, embracing thirty-one subjects of high interest to the farmer, viz:

1. Geological surveys.
2. Reports on coal districts.
3. Mines and minerals.
4. Products of peat moss, &c.
5. Comparison between different kinds of manure in raising potatoes.
6. Extended application of water and other power to farm purposes.
7. Comparative efficacy of the two modes of thorough draining.
8. Reports on irrigation.
9. Forest planting.
10. Sheep pastures at high elevations.
11. Improved sheep salve.
12. On crossing the Cheviot with the New Leicester ram.
13. Cultivation of the recently introduced cereal and other grains.
14. Feeding farm horses on raw and prepared food.
15. Early rearing and fattening of lambs.
16. Insects injurious to agricultural plants.
17. Insects injurious to forest trees.
18. Comparative nutritive property of grasses.
19. Extirpating ferns from pastures.
20. Thorough-draining.
21. Subsoil ploughing of thorough-drained land.
22. Mole plough.
23. Experiments with manures.
23. Analysis of bone or rape dust.
25. On the effects of altitude on vegetation.
26. Feeding of cattle.
27. Forests of larch.
28. On raising improved varieties of grains.
29. Reports on improved rural economy abroad.
30. Honorary premium for reports on certain districts in Scotland.
31. Investigation of certain points connected with the science of agriculture, viz:

An essay or memoir explaining on scientific principles, the mode in which soil operates in producing or facilitating the germination and growth of vegetables.

An essay or memoir describing and proving, on scientific principles, what is the best admixture of the ordinary elements of soil, for promoting the germination and growth of particular vegetables.

An essay or memoir describing, on scientific principles, the mode in which lime operates in rendering the soil better adapted for the germination and growth of particular vegetables.

An essay or memoir explaining, on scientific principles, the effect of drainage in altering the constitution or qualities of the soil, and increasing its fertility.

An essay or memoir, showing the nature of the atmospheric influences on soil, in promoting its fertility, including the modification of these influences arising from heat and cold, dryness and moisture.

Class III.—Waste lands—their improvement by tillage.

Class IV.—Crops and culture.

Class V.—Pastures—their management.

Class VI.—Live stock—district competitors.

Class VII.—Products of live stock—butter and cheese.

Class VIII.—The best kept cottages and cottage gardens.

Class IX.—Woods and plantations.

Class X.—General show of live stock and agricultural meeting at Inverness.

Having shown, by our quotations, something of the vast extent of the recent improvements in the agriculture of Scotland, and the influence which its agricultural society has had in promoting these improvements, we have given the above sketch of their premiums, as indicating the means they have adopted, and are adopting, to bring about this great and salutary change—to show how vast a field they occupy, and the great bearing which science is made to have in the improvement of the soil, and in the operations of the farm.

OATS NOT AN EXHAUSTING CROP.

To the Editor of the Farmers' Register.

The injury done to the crops of wheat for the last four years by the chinch-bug makes it necessary that the attention of Virginia farmers should be directed to the growing of some crop as a substitute. Oats (all agree) are to be preferred to rye, being a spring crop, and on that account less liable to be destroyed by the chinch bug. But fears are entertained by many persons that oats exhaust land more than any other small grain. Now, sir, this is a mere prejudice, for no one can assign a good reason for the opinion. Taking a different view of the matter, and wishing to test its correctness by an experiment, I eight years ago determined to put a piece of land in oats every year during my life, or the land's. I sowed this devoted (as some of my neighbors thought) piece of land six years in succession in oats, and the seventh year (1838) thinking it a little too foul for oats, put it in corn. This year it was in wheat. I shall put it next year to its former occupation, and

continue the crop of oats on it to the end of the chapter. If any injury has been done to this field, by the six years successive crops of oats, I have been unable to discover it, but on the contrary think the improvement evident. I should mention that the land was grazed during the interval of rest, which was very improper, and that it was never fallowed but in the spring. Hereafter it shall not be grazed, and the fallow will be made in the fall. Under this latter treatment I expect great improvement. A friend, T. T. G., tried the same experiment for four years, and the result satisfied him that the vulgar opinion was incorrect. But if oats did exhaust equally with wheat, (which I utterly deny,) fed on the plantation the quantity of manure would be very much increased, and at the end of five or six years larger crops of wheat would be made by applying it to that crop; for as to the notion that wheat straw is necessary to good compost, it is all humbug. I had as soon litter my farm pen from a pine thicket as from a straw stack. The corn made on the field in 1838, under the disadvantages of bug and season, was as good as the field usually brought before it was put in oats. As the signs of the times indicate that at a period not very remote eastern Virginia will find it necessary to raise her own meat, I hope to use this experiment to the increase of my stock for market.

Yours respectfully,

JOHN P. BOLLING.

Amelia, October 14*th*, 1839.

Amelia, October 15*th*, 1838.

I observed this experiment of Mr. Bolling's with some interest, having thought oats more injurious to land than any other crop. But the product of the field in corn and wheat, and its present appearance, have convinced me that I was mistaken. There is no doubt that a field not grazed, and fallowed in September, might be put in oats for any number of years, with slow but continued improvement. WM. PURYEAR.

From Low's Elements of Practical Agriculture.

MANAGEMENT OF GRASS LANDS.

1. *Forage.*

The produce of land which is designed for the feeding of animals may be consumed in three ways:—It may be eaten upon the ground where it grows; it may be cut down and given to animals while it is yet green, which is termed soiling; or it may be dried in order that it may be preserved, when it is termed hay.

The plants employed for these purposes are the different forage and herbage plants which have been enumerated, some of which are chiefly applicable to herbage, some to green or dried forage, and some to either of these purposes.

The clovers and similar leguminous plants mixed with grasses, may be applied alike to forage and to herbage. They form, what in common language are termed the artificial or cultivated grasses; and land, when producing them, is commonly said to be in grass.

The seeds of the grasses and leguminous plants are to be sown in spring, in the manner before described, upon the surface of ground sown with the cereal grasses. When the crop of corn had been sown in autumn, the seeds of the clovers and grasses are sown in spring amongst the growing crop, the harrows passing over the surface with a double turn. When the corn itself is sown in spring, the grass seeds are also sown, just before the last turn of the harrows, and then the roller is frequently employed to complete the process. The seeds are sown either by the hand, or by the broadcast sowing machine, which regulates better the quantity, and sows them with more regularity. Care must be taken that the seeds of the grasses be sound and of the proper kinds, and that those of the clovers be fresh and well ripened, which will be shown by the shining appearance of the seeds; and great care must be used that those of either kind be free from the seeds of weeds.

The proportion in which the different kinds of clovers and grasses may be sown together, is chiefly dependent upon the longer or shorter period for which the land is to remain in grass.

The seeds of the clovers and grasses may be sown in autumn as well as in spring, without any corn crop; and this practice has been recommended, in the case of laying down land to permanent grass, as being calculated to afford a quicker and better sward: and so indeed it may do; but then it is by the sacrifice of a crop of corn, which is too great to be disregarded in the practice of the farm. Cases may exist, in which the value of permanent herbage is so great, with relation to that of corn and other crops, that this sacrifice may be made; but, in the great majority of cases, the advantages to be derived from the practice will in nothing compensate the increased expenditure. There is no difficulty, under good management, of getting the seeds of grasses and clovers to vegetate under the shade of corn in sufficient quantity to stock the ground; and in the forming of a meadow, therefore, there can seldom be a reason for deviating from the simple and economical practice of sowing the seeds of the herbage and forage plants along with the crop of corn.

The seeds, when sown, quickly vegetate, the plants springing up under the shelter of the larger crop; and in autumn, when it is reaped, they will be seen to be covering the surface.

In autumn, the ground may be slightly pastured with sheep; but heavy cattle, which would injure the surface, should not be put upon it, and sheep only for a short time. During the period of winter, the land should remain untouched.

In the following season, the plants may be consumed in either of the three ways that have been mentioned:—

1st, They may be pastured with live-stock.

2d, They may be mown two or more times during the season for green forage, and the aftermath pastured.

3rd, They may be made into hay, and the aftermath pastured.

When they are to be employed in the first of these ways, namely, for herbage, they may be pastured either by sheep or the larger cattle. Sheep may be put upon them in April, while they are yet short; but cattle should not be put upon them till the plants afford a full bite, which will usually be in May.

There is no period in the growth of these plants at which they will afford so early and rich an herbage as in this, the second year after they are sown, or when, in the language of farmers, they

are one-year-old-grass. They will feed the larger cattle perfectly. But it is to sheep that they are in a peculiar degree adapted; and, in the practice of the farm, the larger cattle are usually put upon the old grass, while the sheep are fed upon the young grass.

Whether in any case, a field of young grass shall be applied to herbage or forage, is dependent on considerations of expediency and profit. If there shall be stock upon a farm requiring good and early grass, it may be most advantageous to use the new grass for herbage; in certain cases it may be more advantageous to employ it in soiling; in others to convert it into hay; and in the practice of the farm a portion of it may be applied to all these purposes.

When the grasses and clovers, or any other forage plants, are to be used for soiling, they are mown with the scythe and led directly to a house or yard, and put into a crib or rack, the animals being at the same time well littered with straw, so as to be kept dry.

A field of young grass intended to be mown is managed thus:—When the land is sufficiently dry in spring, it is rolled so as to prepare the surface for the action of the scythe; and should any loose stones be upon the ground, they are gathered by the hand previous to rolling, and thrown into carts driven slowly along the ridges. Sometimes the ground may be too soft to bear the carts, and in this case the stones may be laid in little heaps in the furrows until it is convenient to remove them. These operations should take place in the end of March, or as early as possible in April.

In the northern parts of the country, it is usually the beginning of June before the process of mowing can be begun, but in the southern parts mowing may commence several weeks earlier. The field, or part of a field, reserved for the purpose, is then mown daily in such portions as are required for each day's feeding, and the forage given in its green and juicy state to the feeding animals. While the field, or portion of the field, is thus being gone over, a second crop will have been springing up. Beginning then with the part which had been first mown, the ground is again to be mown daily until it is passed over a second time. In this manner, two crops or cuttings will be obtained, and in favorable situations three. Should there be an interval between the cuttings, that is, should the second crop not be sufficiently ready after the field, or part of the field, has been passed over, then some food must be provided for the feeding animals in the mean time. The best provision in this case is the tare, which is one of the reasons for cultivating this plant on farms where soiling is practised.

The practice of soiling has certain advantages over the more common system of allowing the animals to find their own food in the fields. Their provender is brought to them, and none of it is wasted by their treading it down, while they are freed from that disturbance to which all animals are subject in summer and autumn from insects. It is found, accordingly, that the larger animals feed well under this system, and that a smaller space of ground will be sufficient for feeding an equal number.

As a country becomes rich, highly cultivated, and populous, soiling is the manner of feeding which will naturally prevail. Hence it is practised in this country in the neighborhood of cities where the land can be kept fertile; and it is the system adopted in some of the richer parts of Europe, and in an especial degree in the Netherlands, whence we have derived it.

But although soiling be the most profitable system of feeding where it can be adopted, yet in this country it is in many cases not practicable, and in certain cases not expedient.

The cases in which it is not practicable, are when land does not possess a sufficient degree of natural or acquired fertility to produce good and early crops of grass, or when sufficient straw to litter the animals during the period of feeding cannot be obtained. A large proportion of the land of this country will yield an adequate quantity of grass for herbage, but not sufficiently early and good for regular soiling.

The cases in which soiling is not expedient, although it may be practicable, are when the animals to be fed require exercise to keep them in health and in a growing state. Thus oxen are the better of moderate exercise in their first or second year. Young horses absolutely require it; and even milch cows, although they may be fed in the house or yard, maintain their health better in the fields. To the habits of the sheep, the confinement of the house or yard is entirely unsuited; and although in some parts of Europe the system of soiling sheep is practised, it ought to make no progress in a country abounding in pastures like Britain. A case in which soiling may be applied in all arable farms in this country is that of feeding the working cattle of the farm.

The next and most common method of applying the sown grasses and clovers is as dried forage or hay, in which state they can be preserved and given to the stock in winter, or at other times.

When the sown grasses and clovers are intended for hay, the land is to be cleared of stones and rolled in spring, as in the case of green forage. And when the plants are in full flower, but before the seeds are ripe, or even before the flowers of the clovers have in any degree begun to fade, the crop is to be mown.

The plants, by the action of the scythe, are laid in swathes, with their heads lying pretty regulaly in one direction. The swathes lie for a short time to wither; and are then turned gently over by a fork, or the handle of the hay-rake, in such a manner that they shall not be broken and spread abroad. In 24 hours or more afterwards, they may be put into small heaps or cocks on every third or fifth ridge, according to the bulk of the crop, the ground being at the same time carefully raked.

It is a good practice to put up the hay green in these first cocks, and then to enlarge them by adding two together. If at this early stage they undergo a degree of incipient fermentation, it is no matter. It is in the later stages of the process that heating or fermentation becomes hurtful.

When the hay has become dry in the cocks, the period of which will depend upon the weather, they are made into ricks in the fields. The cocks are dragged together by a horse with a rope, one end of which is attached to one of his traces, and the other end being put round the base of the cock is fixed, to his traces on the other side. He is then made to pull forward the cock to the place required; and in this manner two or more of them be dragged forward at once.

The ricks are made by a person standing upon them to build and compress them. They are formed with a conical top, and are each bound down with a rope made of the hay itself. In this state they may resist a considerable fall of rain; but the hay is not to be suffered to remain longer in the ricks than is necessary to dry it in a sufficient degree to fit it for being stored in a larger stack. When the hay is sufficiently ready, which will be denoted by its feeling dry when the hand is thrust into the rick, it is carried in a large sparred cart to the place where the hay-stack is to be formed, which is most conveniently, in the barn-yard, near the stables.

The hay-stack may be built in a circular or oblong form; the latter is the most convenient when the quantity of hay is large. A number of persons being placed on the stack to build, the hay is forked up to to them, and the stack, by the treading of their feet upon it, is compressed in proportion as it is raised. In 24 hours it will have considerably subsided, and in a day, or two afterwards it is thatched with straw, and bound down with straw ropes; the loose hay of the exterior having been pulled carefully out all around, so that the whole shall present a neat appearance.

Hay, when put into a large mass of this kind, will undergo a slight degree of heat; but, in the case of the clovers, and grasses, the slighter the degree of heat at this period the better, and hence the necessity of a previous preparation of the material as careful as the state of the weather will allow.

Often great difficulty is experienced in the processes of the hay harvest by the wetness of the weather. In such a case the farmer is obliged to watch the intervals of favorable weather, and employ every practicable means to forward the operations and secure the crop.

Some recommend the strewing of salt upon the hay, as the building of the stack proceeds. This corrects the tendency to fermentation, and renders injured hay palatable to stock.

In the making of hay, the great end to be aimed at is to prepare it as quickly as possible, and with as little exposure to the weather, and as little waste of the natural juices, as circumstances will allow. When we are enabled to do this, the hay will be sweet, fragrant, and of a greenish colour.

It is not usual to cut more than one crop of hay from the same ground in the year, although the second crop of the grasses and clovers may also be made into hay. It is never, however, so good as the first crop in weight and quality; and, besides, the late period of the season renders the preparation of it difficult or precarious. For these reasons the proper system is to pasture the aftermath, and not to make it into hay.

Wherever the system of the cultivated grasses is perfectly understood they will never be mown for hay more than once. The first year's aftermath, and all the subsequent years' grass, so long as the land remains untilled, are to be used for herbage alone.

The produce of hay varies greatly with the quality of the soil and state of the season. About 2 tons per acre may be regarded as a good crop, but often the produce is greatly more, and then the crop is considerd to be a great one. Hay, in the field rick, weighs somewhat better than 112 lb. per cubic yard; after being compressed in the stack it weighs from 140 to 180 lb., and when old about 200 lb.

Clovers, besides being raised for pasture or soiling, are sometimes cultivated for their seeds. In this case the clover to be cultivated should be sown by itself, pastured with sheep till pretty late in May and then allowed to grow and ripen its seeds. When the seeds are fully ripened, the crop is cut down, and formed into very small cocks, which, after being, thoroughly dried, are lead home, and put into stacks until thrashed. The process of thrashing is a somewhat troublesome one, from the difficulty of separating the seeds from the capsules. It is usually done by the flail; and the seeds may be winnowed in the same manner as grain, but with sieves adapted to the purpose. This species of cultivation, however, has narrow limits in this country. The crop is a great exhauster of the soil, and, from the late period of ripening and the extreme dryness to which the plants must be brought, it is a somewhat precarious crop, even in the more favorably situated parts of the island. For these reasons the great part of the clover seeds consumed in this country is imported.

The grasses too, are frequently cultivated for their seeds. In this case the particular grass to be cultivated should be sown by itself. It should be dried and stacked like a crop of corn, and thrashed and winnowed. When the crop of this kind is cultivated, it should be regarded as an exhausting crop, and the land treated as if it had borne a crop of corn.

Sometimes the seeds of rye-grass are procured by a more partial process. The hay being put into cocks in the usual manner, it is thrashed just before being but into the larger ricks. The thrashing is performed in the field on a moveable floor of boards, placed upon a coarse convass cloth. In this case the hay should be slightly beaten by the flail, so as to detach the best ripened seeds without too greatly injuring or breaking the stems. The seeds are then but into sacks, and carried to the granary, on the floor of which they are spread and turned over as occasion requires. When dry, they may be dressed; or they may remain mixed with the chaff till spring. The hay, however, is always injured where this system is practised, both because it is deprived of the seeds, and because it is necessary to allow the plants to stand for a longer time to ripen than would otherwise be required.

No method of producing hay has been found comparable to that of the cultivated grasses. Under this system, the forage-plants are cut when in their state of most luxuriant growth, and no manure is laid upon the surface in order to produce the hay; the manures being applied to the preparatory fallow or green crops, in which case they are covered by the plough and rendered entirely available. Yet over the greater part of England, land is kept permanently in grass for the purpose of mowing it, manure being applied from time to time to the surface. This system has become the very habit of the country, and, by the general adoption of it, beyond a question a vast public loss is sustained. The practice of the cultivated meadow was probably introduced into England by the Romans, and at a long subsequent period was made more fully known by the Flemings; and yet by far the greater part of all the hay produced in this island is derived from perennial meadows, and

thus an expensive method of production substituted over a whole country for one more cheap and efficient. Certain peculiarities in the state of property in England, the effect of tithes, and the relative expense of keeping land in tillage and under grass, seem to have contributed to this so general substitute of the natural for the cultivated meadow. From habit too, a preference is given to the hay thus produced. It is supposed by many to be more suited to keep horses in wind; and it may be so in the case of horses put to great speed, as the hunter and the race-horse; but, for the mere purpose of feeding, it cannot be doubted that the produce of the cultivated meadow, consisting of the superior grasses and clovers alone, in their young and most juicy state, must be greatly superior to that of the older grasses, mixed as they always are with a class of inferior plants. But if the large application of capital and the waste of land, for the production of this species of food, are to be regretted, in no other country are the farmers so diligent and so experienced in the management of the hay itself as in England.

The grasses to be mown are ready in the month of July, and they are cut down when the greater number of them have come into flower. When the land is of good natural quality, or when a ready command of manure exists, it may be mown every year for hay. But it is more common to mow it every alternate year, or every third or fourth year, according to its quality. It is then pastured in the intervening years, and in this way it is less exhausted than when mown every year.

Land subjected to this species of culture requires to be manured at intervals upon the surface. When it is mown every year, the manures should be repeated every second or third year; but when it is occasionally pastured, the manuring may be less frequent.

The manures used may be of all the kinds applied to land in tillage. That most commonly employed in practice is the common manure of the farm-yard, well rotted. This is spread thinly and regularly over the surface, generally at the rate of 7 or 8 tons to the acre. The period of laying it on is various; some preferring to spread it in October, others after the hay is cut in July or August, and some in spring.

The grass, when mown, is soon afterwards tedded, or spread abroad with a fork, so as to be exposed to the sun and air. It may be turned over one or more times, and while yet green put into little cocks. The manner of collecting the grass together is by raking it into rows, technically termed wind-rows, the hay-makers in bands following each other with rakes until they have thus collected the whole into rows. They are then easily able, by hand labor, to form it into the small cocks described.

These first cocks are afterwards to be spread abroad, and, being exposed for a time, formed into larger cocks, termed sometimes bastard-cocks. In the county of Middlesex, where extreme attention is paid to the appearance and quality of this species of crop, the bastard-cocks are again spread abroad, and formed into yet larger cocks; after which they are led home, sometimes on the fourth or fifth day. The object of this repeated spreading abroad, and forming into cocks, is to secure the hay in the shortest time, and with the least waste of its natural juices. This indeed is aimed at in all cases of making hay, but the details of practice are modified by the state of the weather, and vary in different parts of the country. Sometimes, to economise labor in these operations, hay-tedding and hay-raking machines are employed.

Although raising of hay on the natural meadow must be regarded as expensive, when compared with the raising of it on the cultivated meadow, yet there are soils and situations to which the practice is entirely suited, and in which it is the best means at the command of the farmer of obtaining dry forage.

One of these is the case of marshes, swamps, or bogs, producing naturally rushes, sedges, and the larger grasses. These marshes are of every degree of natural fertility, sometimes producing chiefly the *Carices* and *Junci*, and at other times producing the grasses of wet ground, as the *Poa aquatica*, *Poa fluitans*, *Agrostis alba*, and other plants of marshes.

The lowest for the most part in the scale of fertility of these wet grounds and yet of great importance in the elevated districts where they abound, are those which consist of a thick bed of peaty matter. These are usually termed bogs, and the produce consists chiefly of rushes, as the sharp-flowered jointed rush, and others. This species of hay is greatly less nutritive than that of cultivated or finer natural grasses. It is generally regarded as a little superior to the straw of wheat, barley, or oats, and will for the most part bear cutting but once in the year. It is too coarse for sheep, but is adapted to the winter provender of cattle. To these it affords a valuable resource in all the more elevated pasture districts of this country.

As the soil of the marsh improves, so for the most part does the natural produce which it yields. In flat and alluvial tracts the hay of the marsh is often valuable, even where cultivated forage can be otherwise obtained. It is frequently, therefore, a question of expediency, whether a marsh shall be broken up for tillage or allowed to yield its natural plants. It may produce a great deal of manure without requiring any; it may furnish a valuable resource to wintering stock; and it may not be capable of being fitted for cultivation but by a considerable expenditure of capital.

The manner of preparing the hay of marshes, is similar to that of preparing the hay of the grasses already described, except that greatly less nicety is required. The rushes or grasses, after lying for 48 hours or more, should be tedded well, so as to receive the influence of the sun and air. After this operation, which is usually repeated once or oftener, the hay should be put into small cocks, and, when sufficiently dried, put into ricks, to remain in them till the danger of fermentation is removed, when it may be led home and formed into a stack. A slight fermentation in the stack may take place without injury, but care must be taken that this be not carried so far as to injure the hay.

There is another case in which perennial grass land, though not marshy, may be beneficially employed to produce hay. This is in elevated pasture districts, where cultivated forage cannot be obtained. In such situations, hay must be procured for the stock during falls of snow, and then the only means of obtaining it may be to set apart a portion of the herbage-land for mowing. This is a case produced by the peculiar circum-

stances of sheep farms; and it does not invalidate the general principle, that hay is best produced on the cultivated meadow.

One other method, indeed, of producing natural hay free from all objection on account of the waste of manures, is yet to be considered. This is irrigation; but irrigation applies to the production of herbage as well as dry forage, and we may therefore first consider the management of land in the state of perrennial herbage.

(To be Continued.)

BENEFIT OF LIMING, AND GREEN MANURING WITH PEAS.

To the Editor of the Farmers' Register.

Beaufort co., N. C., Oct. 11, 1839.

I learn by your communication to me some time since, that it is your wish that I should let you know my plan of liming, and also that I would communicate the same for the Register. I would cheerfully do so, but that I am a plain, and fain would be a practical farmer, and have never written any thing of the kind. But, however, for the sake of being of any benefit to agriculture, if any benefit may be derived from the few hints that I may advance, I will now attempt to comply as far as my feeble efforts are capable of doing.

When I took possession of my farm, I found it in a very poor and worn out state, so much so that I became almost discouraged, and would have emigrated to some other one, had I the means to have done so without making a sacrifice; and not willing for that, I came to the conclusion that I would remain where I was, and see what I could do by way of improving my poor and worn out land, which I commenced by raking and scraping all the manure I could fall in with; and coming across a treatise in some one of your volumes upon liming, I fell upon that to see what I could do with it. The first part or cut of my field that I commenced liming, was of a kind of stiff and sour soil, subject to almost (I may say) every kind of insect; and it was with great difficulty I could get corn to stand on it. But as soon as I commenced liming I found that there was a great difference in the nature of the soil as well as the quantity of the grain, which induced me to procure all the shells I could get, and put them upon my land; and I can now say that I have improved my land, from liming and other manures, of which lime is the prominent part, from 25 to 50 per cent. My plan is to burn the shells just so that they will crumble.

I prefer putting them out on the land in the spring, say the last of March upon land that I intend putting in corn; spreading the lime broadcast; and about the last of June, or by the first of July, I sow the same land in peas, which is the last working I give my corn. As soon as the corn will do, I take the fodder off. As soon as that is got through with, I proceed to weed all down between the rows, peas and every other vegetation, which as soon as done, I proceed to gather the corn and sow wheat upon the same, taking care to run a furrow each side of the ridge in the row with a single horse plough before sowing, so as to cover the ridge up as near as possible; the balance of the row I break up with the same plough. But before I sow my wheat I soak the quantity I want for seed in strong lime water, say 24 to 36 hours; after which I strain it through a basket or colander, and as soon as that is done, I roll it in slacked lime until every grain is perfectly saturated with lime, so that it parts, in which state I let it go to the ground, taking care that the seedsman uses a little grease of some kind on his hands to prevent the lime from injuring them. This process I think, and am certain, is a preventive from the smut; and putting it on limed land I think is an obstruction against the rust, or at least I have not been troubled with either since I tried the soaking and liming. The quantity of lime I generally put on my land is from 40 to 50 bushels to the acre, afterwards sowing down in peas as above stated; and I can say this year that I never was more gratified; for I never saw a more flourishing crop of wheat on the ground in all my life, (and my neighbors certified to what I now say,) for I raised 25 bushels to the one sowed; and I had the same piece of ground in wheat three years ago, and I am certain I did not raise ten to one. I am now preparing the same land, and am in hopes to be able to have it ready by next week; and if the season suits, I am certain to get thirty for one, as I shall have my land in better order; besides I have another coat of manure upon it.

I have tried the cuttings (or slips) of Irish potatoes which I saw in one of your numbers, and find that good ones can be raised from the tops. I cut a few this summer after they had got up about a foot high, and planted them crosswise of a small ridge I had made for the purpose, and they were almost as large as those I planted, which I obtained from the north.

A Friend to Agriculture.

THE MORUS MULTICAULIS MARKET.

If we could still believe printed and apparently fair statements, we might now copy reports of large sales at high prices, made at the north since our last publication, and thereby exhibit indications, (which could not be doubted, if they stood alone,) of a continuing high market value. But we do not quote any such, because we have no confidence in them. Though we have heretofore warned the public of the tricks and falsehoods used to raise prices, we were ourselves to some extent deceived by them; and thereby induced to believe that there was more solidity and permanence in the early prices of this summer than has since appeared. But if prices were before raised by the tricks and deceptions of some speculators above their intrinsic worth, they have been more lately sunk as much below that worth by the tricks and deceptions of others having a contrary interest. So it is, that the market is now flat—the factitious appreciation and speculative value at an end, for the present time at least—and the trees should now be held at their intrinsic value, for propagation and for feeding silk-worms—and for that legitimate use, they are worth much

more than ten cents, at which price they have been lately sold in Richmond. Now is the time for holders of the trees to provide for their use, by commencing and effecting the establishment of cocooneries; and now also is the time for all who desire to commence that business, to buy their stocks of trees on the best terms. The depression of the price of trees furnishes no argument against the profit of rearing silk-worms; but, on the contrary, offers a great additional facility, and another element of profit. Let but every present planting in Virginia be put next season to this use, *in proper manner*, and we venture to predict that no cultivator will have cause to repent his outlay for the culture either of the trees or of their product in silk.

CULTURE OF RUTA BAGA.

From the Farmers' Monthly Visitor.

Dear Sir—Believing ruta baga to be of great value to the stock farmers, and as the season for sowing is at hand, I send you an extract from my farm journal, relative to my mode of culture the first year, though, as it was my first experiment, I am far from thinking it to be the best mode. However, as I was pretty accurate in detail, its publication may be of use to my brother farmers, by inducing some one better acquainted with its culture than myself, to point out the errors in my process.

In the fall of 1836, I broke up three acres of green sward; the soil a stiff loam, upon which I carted 150 single loads of coarse manure, and in 1837, planted with potatoes, there being nothing peculiar in the management, or extraordinary in the crop.

In the spring of 1838, I carted on sixty loads of well rotted manure, which I ploughed in, so soon as the ground was sufficiently dry, and on the 27th of May I again ploughed, harrowed, and after rolling smooth, marked it into squares of eighteen inches, and planted by dropping two or three seeds in each intersection, which was done by shaking the seed from a box, with a single hole in the top. I sowed from the 1st to the 4th of June; on the 23d began to weed, thinning out where the plants were too crowded, and setting out where deficient, which I continued to do occasionally when other work did not press, till the 28th July. On the 26th October, I began to pull and cut, finishing on the 9th of November; and I found the plants last pulled as uninjured as the first, although they had been exposed to several severe frosts. They were pulled by hand, the workmen striking two plants together to shake off the dirt, and then throwing them down, where they lay spread for three hours to dry the loose dirt that still adhered to them; the tops were then twisted off, and the plants thrown into heaps for carting, so that each root was handled three several times. They might have been got into the cart with less labor, but my object was to get them into the cellar in a tolerably clean state. Having heard much of the difficulty of keeping them in cellars, from their tendency to rot, I stored in one cellar, 1,500 bushels without injury to a single root, and I have now, (May 5,) more than 100 bushels as full and as fair as when first placed there. The cellar was thirty feet square, on the bottom of which, eight inch timbers were placed, and covered with plank two inches apart. The whole was divided into two bins, with one foot space between the bins, and one foot between the bins and the cellar wall; the sides of the bins being made with narrow boards, with a space of four inches between each board.

I fed out my twelve hundred bushels to my sheep, six hundred to my horned cattle, and the remainder to my horses. They all ate with avidity, preferring them to potatoes. For my horses and cattle they were merely cut with a spade; for the sheep, they were passed through a vegetable cutter. They were carted in two carts, each containing thirty baskets holding more than a bushel, and weighing seventy-four pounds. The number of baskets was twenty-one hundred, and the whole weight *seventy-seven tons*. Number of roots, 36,000—as put in the extract from my journal alluded to above. I am, sir, very respectfully, your ob't servant, LEONARD JARVIS.

Ruta Baga,	*Dr.*
To interest on three acres, at $100 per acre,	$18
Twice ploughing three acres,	6
Harrowing and rolling,	4
Seed,	2
To 130 days' work on above, viz. 9 days, sowing, 85 weeding, hoeing and setting, and 36 drying and cutting—130 days, or, five months, at $13 per month,	65
To 22 weeks' board, at 9s. per week,	33
	$128
Cr.	
By 2100 bushels at 10 cents,	$210
Profit, estimating at 10 cents,	82
	$210

Claremont May 5, 1839.

Remarks.—Compared with the price of other crops, this ruta-baga was richly worth twenty cents the bushel; say it was worth only fifteen cents, the net profits on these three acres of ground were *one hundred and eighty-seven dollars.*

We are highly pleased to exhibit this evidence from one of the first, and we believe the most extensive practical farmers in the state of New Hampshire, in favor of the root culture. He shows by this experiment what much manure will do for a succession of years: it gives double payment in a single year for the labor bestowed; and this double payment will extend itself into a series of from four to ten years, according to the capacity for retention of the soil to which it is applied.

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

The distempered state of affairs which has prevailed since the resumption of specie payments fourteen months ago, is succeeded by a second suspension in Pennsylvania and the states south of it. In this instance Philadelphia took the lead, and the first movement is ascribed to the United States Bank—now a state institution, with very extensive privileges, very extensively exercised.

The example set in Philadelphia, and followed up in Maryland and Columbia, was very reluctantly adopted by the banks in Virginia, whose operations have been conducted with much prudence; but as a constant drain of specie has been made from them which could not be reclaimed from the suspended banks, self-preservation rendered it necessary to check it. However early a period of resumption may be proposed, Virginia will be ready to assent to it. The banks north and east of Philadelphia, with the exception of those in Rhode Island, have not suspended, and the circulation of the city banks is so small that they may be able to continue specie payments. The pressure on their mercantile communities is however very severe, and the most enormous rates of interest are submitted to—from 2 to 4 per cent. per month. It cannot be otherwise than that many failures must occur, and that an entire derangement prevails in commercial affairs. The difference of exchange between New York and the cities south of her is 7 to 12 per cent. In New York the rate of exchange on London is 8 to 9, while in Philadelphia, Baltimore, and Virginia, it is 18 to 20 per cent. premium.

The banks in Virginia are constantly diminishing their circulation, consequently there is an insufficiency of money for the transaction of business. The result of which must be low prices, when produce shall be freely brought to market.

Very little of the new crops of cotton and tobacco has yet appeared, and prices are not established. The first sales of cotton were at 12½ to 12¾ cents, and recently at 11 to 12 cents.

The weather in England to 20th September was unfavorable for the wheat harvest, and shipments of flour to some extent are now going forward from this country. Wheat has consequently risen about 25 cents per bushel, say $1.25 to $1.30; and flour to $6¼ to 6½, in New York $6. X.

October 26, 1839.

SILK MANUFACTURING.

From the Genesee Farmer.

One great reason why we have such an unshaken confidence in the ability of this country to enter successfully into the culture of silk, its manufacture as well as its production, is found in the superior enterprise, industry and ingenuity of our citizens over those of any part of the world. Great Britain thought to prevent the establishment of the cotton manufacture in this and other countries, by prohibiting, under severe penalties, the exportation of machinery, or patterns for its construction. New England machinists went to work, built shops, made their own patterns, and produced specimens of machinery so much superior in action and principle to European models, that we at once obtained the preference in their own market, and now annually export large quantities of machinery to order. So it is already with machinery for the manufacture of silk. In reeling, and now in weaving the narrow kinds of silk, such as laces, ribbons, and other goods of that description, we have already made great advances on the clumsy and ill-arranged implements of the old world.

In the manufacture of ribbons, which forms so important a branch of the Lyons, or French silk manufacture, the foreign workman uses a narrow loom, resembling the common hand loom in other respects, and weaving but one piece of ribbon at a time. A machine, called in France a Jacquard, is attached to this narrow loom, and regulates the pattern of the ribbon, flowers, &c.—These looms are worked by girls, and these delicate and beautiful fabrics are the result of their labors. A Jacquard was brought to New York, and fell under the notice of Mr. Bergen, an ingenious mechanic, and member of the Legislature. Mr. Bergen instantly saw that great improvements might be made in the machine and loom, and immediately constructed one which is worked by power instead of the hand, makes seven pieces of ribbon or lace, where only one was made in the French loom, and gives the figure, color, or pattern with equal exactness and greater rapidity. In this single improvement of the ribbon loom, then, five or six sevenths of the labor required abroad is wholly dispensed with, and articles of any pattern can at once be furnished. In very narrow patterns, from ten to fifteen pieces can be woven at once. Such improvements at the outset leave no room for doubt, but that when the attention of our artizans shall be directed to the manufacture of silk machinery, we shall soon find our improved processes amply to compensate for any supposed difference in the prices of labor.

DEATH OF JUDGE BUEL.

From the Cheraw Gazette.

Judge Buel, the able and distinguished editor of the Albany Cultivator is dead. On his way to New Haven, Conn. whither he was going to address an agricultural meeting, he was arrested on the 6th. inst. at Danbury, by sickness, which in eight or ten days proved fatal. There are hundreds of men in the land whose names are better known to the great mass of even intelligent agriculturists, who have been more bespattered with fulsome praise by a frothy public press, and whose death would be much more extensively deplored; but we are sure we do not say too much when we say there lives not a *politician* who, during his whole life, has done the tenth part of the tithe as much towards advancing the true prosperity of the country as Judge Buel did during the half dozen years he conducted the Cultivator.

TO SUBSCRIBERS.

To give abundant notice and time from action, the "Conditions" of publication for the next and succeeding volumes of the Farmers' Register are published in this number. It is earnestly requested of all subscribers to read them, and observe the new facilities offered; and of those who may not intend to continue their subscription, either on the former and general, or the new and contingent terms, it is also requested that they will at least make known their discontinuance in rightful and proper manner, and as early as may be

convenient. It is very important to the interest of the publisher to know as early as possible the changes to be made on his list, both by withdrawals, and new subscriptions added.

The reduction of price in consideration of prompt and advanced as well as combined payments, and of additional subscriptions furnished, has worked so well, that the regulation will be made permanent, and each subscriber, for the next and for each succeeding volume, may obtain a like reduction, by his *annually renewed compliance* with the like or other requisitions.

From all recent subscribers who have been brought upon the list under the new conditions, and also the old subscribers who aided their admission, we especially beg attention to the following remarks.

Under the new conditions for this volume, the two classes of subscribers named (being all who have chosen to avail of the offer,) have received their copies of vol. 7, for the net payment to the publisher of $5 for two volumes; or, on the general average, at half the regular price for each individual subscriber. But each one of these subscribers, after his payment is made, stands precisely upon the same ground, and under the same terms of agreement for the future, as all other subscribers heretofore, or as do all others who have *not* made use of the privileges offered. That is, each of these subscribers, like all others who have paid their dues, is perfectly free to discontinue his subscription *before* the commencement of the next volume; if not thus discontinuing, each will have the privilege of obtaining an extra copy of the next volume, for a *new* name and subscription, in the same manner as was done for this volume; and thus every one, by using the means proposed in each successive year, may continue to obtain his own volume every year at half price. Or, by an additional privilege now offered and made permanent, every person, or club, sending $25 in advance, and before February 1st of each year, may thereby pay for and receive 10 copies of that volume, whether for old or for new subscribers. Therefore, the mere forming and keeping up a club of any ten or more names, will put the work to all, for such prompt and joint payments, at half price. But every one on the list who does not take either of these steps, within the several limits of time allowed, will be bound for his subscription at the regular and full price of $5 the volume.

It is true, and no less obvious, that the main inducement to offer to supply two copies for the price of one, was the expectation that most of those who thus first became readers, would appreciate the value, and continue to be afterwards supporters of the publication. But we make no claim to continued subscription on that score. If, however, each one of our subscribers would each year take the little trouble necessary to send a new name, and thus obtain the copies at half price for both—and if, with this, every subscriber who desires to discontinue the work, would give proper notice, and in due time, the publication could well bear all such withdrawals, and would be all that could be reasonably desired on the score of profit to the publisher, and, at the same time, of cheapness to the subscribers. It would lead to this state of things—a sufficiently large number of subscribers, all paying punctually in advance, and the work furnished to all for half price.

The results sought to be obtained by these offers would be no less beneficial to the subscribers than to the publisher; and therefore, independent of all public and patriotic considerations, they are required by self-interest to lend their hearty aid. The publisher therefore presumes to ask that this aid may be given, for the benefit of the givers, and of the country at large. He has no right to expect that any thing should be done merely to aid his own private interest or gain. If but a slight effort were made by every subscriber, the effect of the general action would be to make the Farmers' Register one of the cheapest works of its kind; and if the still more valued and needed aid of the pens of its readers were given as freely as it should be, the value and usefulness of the work would be increased still more than its cost would be lessened. There is not one individual who may read these lines, who cannot forward one or both of these most desirable results.

SUSPENSION OF PAYMENTS BY THE BANKS.

While this great public calamity continues, one of our heretofore existing conditions must also, of necessity, be suspended—that which requires payment from subscribers in notes of, or checks on, "*specie-paying*" banks. In addition to our sharing, with the community at large, this general calamity, our publication must suffer heavy additional loss in discount upon the payments of remote debtors. But we have no choice but to submit; and will receive in payment the *current notes* of any *city* banks, of the state in which the debtor resides. North Carolina notes (which are at par in Petersburg,) or notes of any bank in Virginia, will be greatly preferred. Even these are now depreciated here 10 per cent. and more southern notes from 10 to 20 below them, or from 20 to 30 per cent. below specie. Such a state of things is alone sufficient to break down a periodical having very wide and scattered cultivation; and we despair of any *bona fide* resumption of specie payments by the banks, or of their ever being able to maintain a paper currency *truly convertible into specie*.

CONDITIONS OF THE FARMERS' REGISTER,

For the eighth and subsequent volumes. Prices still more reduced, for combined and punctual or advanced payments.

Art. I. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, at $5 a year, payable in advance. Or, for $5 may be had *two copies* of the same current or forthcoming volume, for *new subscribers*, if so ordered and paid for in advance, (or at the time of making the subscription,) in current money, as described below, (Art. VI.) and without loss

or deduction for postage, or any other charge to the publisher.

II. Subscribers who may have already paid the regular subscription price of $5 in the manner above required, for a single copy, shall have the privilege, upon sending a *post-paid* order, of having a second copy of the same volume sent to any NEW subscriber, without further charge, for that volume, if so ordered during its time of publication.

III. A like privilege will be allowed to every old subscriber who has not paid, but who shall do so, as above, before the issue of the 6th number of the then current volume, (at which time of all debtors' bills will be made out and sent); thus in effect REDUCING TO HALF PRICE THE COST OF THE WORK TO EVERY SUBSCRIBER, OLD OR NEW, WHO MAY CHOOSE TO AVAIL OF THE OFFER. (See also Art. V.)

IV. If, however, no more than one copy is ordered, the subscription price will still be, as heretofore, $5 the volume; as it is not designed to permit any subscription debt, or payment, to be made for less than $5. And if an order is sent for two copies, without full compliance with the conditions annexed, (in Art. VI,) only one will be sent.

V. Clubs of ten subscribers (old or new, or of both) by sending $25 (net payment) in advance and at one time, before February 1st, of each year, shall be furnished with ten copies of that volume only.

VI. The price of back volumes, as heretofore, is $5 for one alone, $10 for any three together, and in the same proportion ($3.34 cents each,) for any number of volumes short of a full set. Entire sets of 8 vols. (the 8th commencing January 31st, 1840,) will be supplied for $20, or $2.50 the volume, paid in advance, with the order.

VII. ALL MAIL PAYMENTS MUST BE MADE IN NOTES, OR CHECKS, OF PAR VALUE IN VIRGINIA, or of a CITY bank of the state in which the subscriber resides. And all letters to the editor in regard to the Farmers' Register must be post-paid—except such as contain articles for publication.

VIII. The risk of loss of payments for subcriptions sent free of postage, which have been properly committed to the mail or to the hands of a post master, is assumed by the editor.

IX. For all copies not received by mail, at the proper post offices, duplicates will be furnished to those subscribers *who have complied with their own obligations;* provided that the failure *shall be notified through the postmaster,* and *within one month after the date of the miscarried copy.*

X. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year. Subscriptions must commence with the beginning of some one volume, and will not be taken for less than a year's publication.

XI. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the first number of the volume is issued; and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor, (or in obedience to the regulations of the Editorial Convention.)

Petersburg Va., November 1st, 1839.

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